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HISTORY
OF THE
BERWICKSHIRE
NATURALISTS' CLUB.

INSTITUTED SEPTEMBER 22, 1831.

—“MARE ET TELLUS, ET, QUOD TEGIT OMNIA, CÆLUM.”

ALNWICK :
REPRINTED BY HENRY H. BLAIR, MARKET PLACE

MDCCCLXXXV,

MEMBERS.

	Date of Admission.
1. George Johnston, M.D. Berwick-upon-Tweed - - - - -	Sept. 22. 1831.
2. Rev. A. Baird, of Cockburnspath - - - - -	.....
3. Rev. John Baird, of Yetholm - - - - -	.....
4. Mr William Baird, Surgeon, H.E.I.C.S. - - - - -	—... ..
5. R. D. Thomson, M.D., H.E.I.C.S. - - - - -	.....
6. Mr Robert Embleton, Surgeon, Embleton - - - - -	.....
7. Mr G. Henderson, Surgeon, Chirnside - - - - -	.....
8. Mr John Manners, Surgeon, Berwick-upon-Tweed - - - - -	.....
9. Mr Alexander A. Carr, Surgeon, Ayton - - - - -	.....
10. James Mitchell, Esq., Surgeon, R.N. Wooler - - - - -	Dec. 21. ...
11. Mr Thomas Brown, Langton - - - - -	.....
12. P. J. Selby, Esq., of Twizell House - - - - -	April 20. 1832.
13. Mr W. Leithead, Solicitor, Alnwick - - - - -	.....
14. Mr Joseph Barnes, Fel. Trin. Col., Cambridge - - - - -	June 18. ...
15. Rev. J. Campbell, Tweedmouth - - - - -	July 18. ...
16. Mr T. S. Good, Berwick-upon-Tweed - - - - -	.....
17. Mr Robert Dunlop, Berwick-upon-Tweed - - - - -	.....
18. Sir William Jardine, Bart. Holmes - - - - -	Sept. 19. ...
19. Captain Carpenter, Ford Cottage - - - - -	April 16. 1833.
20. Rev. Mr Knight, Vicar of Ford - - - - -	.....
21. Henry Clarke. M. D., Berwick-upon-Tweed - - - - -	.....
22. Mr John Whitelaw, Berwick-upon-Tweed - - - - -	May 19. ...
23. Major Thomas Watson, H.E.I.C.S. - - - - -	.....
24. Rev. Henry Armstrong, Curate, Wooler - - - - -	July 17. ...
25. Rev. Mr Knight, of Mordington - - - - -	Sept. 18. ...
26. Rev. Mr Cunningham, of Dunse - - - - -	.....
27. W. F. Bow, M.D., Alnwick - - - - -	.....

EXTRAORDINARY MEMBERS.

1. Miss Bell, Coldstream - - - - -	Sept. 22. 1831.
2. Miss Elizabeth Bell, Coldstream - - - - -
3. Miss Hunter, Antonshill - - - - -
4. Mrs Dr Johnston, Berwick - - - - -	Dec. 21. ...

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PROCEEDINGS
OF THE
BERWICKSHIRE NATURALISTS' CLUB.

THE BERWICKSHIRE NATURALISTS' CLUB was instituted for the purposes of examining the Natural History and Antiquities of the county and its adjacent districts, and of affording to such as were interested in these objects, the opportunity of benefiting by mutual aid and co-operation. The first meeting was held on the 22d of September 1831, at Bank-House, in the parish of Coldingham, when the following resolutions were agreed upon:—

1. That the Gentlemen present form themselves into a Club, to be named THE BERWICKSHIRE NATURALISTS' CLUB.
2. That the object of the Club shall be to investigate the natural history and antiquities of Berwickshire and its vicinage.*
3. That all Gentlemen interested in these objects shall be eligible as members, provided three-fourths of the members present when their admission is proposed are agreeable.
4. That the Club shall hold no property, and exact no fees of admission.
5. That the Club meet five times within the year; viz. 1st, on the third Wednesday of September; 2d, the third Wednesday of December; 3d, the third Wednesday of April; 4th, the third Wednesday of June; and, 5th, on the last Wednesday of July.
6. That the Secretary send a written notice of the place and hour of meeting, eight days previously, to each member.

- 1 *Address to the Members of the Berwickshire Naturalists' Club.* By
GEORGE JOHNSTON, M.D. (Read at its first Anniversary Meeting,
held at Coldstream, September 19, 1832).

GENTLEMEN,

BEFORE I leave the distinguished station which, by your favour, I hold in this Club, you will permit me to take a cursory view of what has been done, during this the first year of its existence, towards forwarding the objects for which we principally associated ourselves; a more accurate knowledge, to-wit, of the natural history and antiquities of Berwickshire and the adjacent parts of the neighbouring counties: and I am induced to do this, not because our labours have elicited much of interest or importance; not because I can hope to give any additional impulse to your zeal, or direction to your future pursuits; but that I may, as far as in me lies, set an example to my successors in this chair, to give you, at each succeeding anniversary, a summary of the communications and researches of the members during the year; so that the results of these may not be lost, and that their bearings and connections may be pointed out. The review, also, may serve to remind us of those departments of the natural history of the county which have received the least notice and illustration, and where, of course, our inquiries may be most usefully directed in future.

Birds.—At our meeting in July, it was mentioned that a male bird of the rose-coloured ouzel (*Pastor roseus*) had been shot at West Ord, in the vicinity of Berwick, on the 13th of that month, by the Rev. Mr Campbell. No previous instance of the occurrence of this beautiful bird in North Durham is known; and very few instances of its occurrence in the north of England are on record¹. It is a summer visitant, coming to us at uncertain intervals; compelled, perhaps, to make these parts by the force of some contrary storms: and, in this respect, it resembles another bird, the Egyptian goose (*Anas aegyptiacu*), a small flock of which is recorded to have visited the Tweed, at Carham, in the beginning of February last². This flock, as is conjectured by Mr Selby, may probably have made its escape from Gosford, the seat of the Earl of Wemyss, upon the Firth of Forth, where numbers of these birds are kept in the artificial pieces of water³.

¹ Mr Selby has a specimen, shot near Bamborough; and two others have been taken not far from Newcastle. (*Trans. Newc. Soc.*, i. 263.) It is singular that these were all males.

² Kelso Mail for Feb. 6. 1832; *Mag. Nat. Hist.* vol. v. p. 565.

³ *Trans. Newc. Soc.* i. 290. Five were seen on the Farne islands in April 1830 and, in March 1831, a female was killed near Berwick. (*Ibid.*)

These are the only birds remarkable for their rarity, which have occurred during the year; for I do not remember that any such was met with in our excursions. In that of June, made to Langleyford, at the foot of Cheviot, our distinguished colleague, Mr Selby, entertained some slight hopes of meeting with the ring-thrush (*Turdus torquatus*), which, it was supposed, might breed near this sequestered hamlet: but the information of the respectable tenant proved the contrary; for the bird is seen there only in the later autumnal months, on its return from still more inland and more remote moors. During our ascent of Hedgehope on that day, the curlew (*Numenius arquata*) first, and, somewhat higher up, the golden plover (*Charadrius pluralis*), uttering as it flew from us its shrill plaintive cry, were seen in their breeding-grounds; and the blackcock (*Tetrao tetrix*) was heard harshly calling to his mates. On this occasion, as on several previous ones, I was struck with the cries of the birds we noticed: there was no sprightliness in them, nor melody; but all were plaintive, or rapid and harsh—and tended to increase that still sobriety—that almost solemn mood—which irresistibly steals over the mind of him who traverses these noiseless, wide, dark-brown moors. The melody of the groves is not in harmony with the scene; and the warblers leave it willingly for haunts nearer the cheerful buzz of man and civilization. But our excursion in July presented us with a most remarkable contrast to the scenery of the Cheviots: a wide and rough rolling sea, a coast fronted with lofty, dark, and precipitous rocks, caverned with gloomy recesses, so bold, so rugged, and naked, that Scotland scarce boasts one of superior grandeur. And how diverse were its feathered tenants in appearance and habits! The slender-legged tribes of the moor, clothed in a mottled plumage, were here replaced with birds distinguished by short legs, strength of body, and by colours disposed in large and unmixed patches, often strongly contrasted: and while the former wheeled round and about us in circles, muttering their cries on wing, the latter flew out in a straight undeviating line, and silently. Nor were they less distinguished by their voices; for the cries of seafowl are never plaintive, but most harsh, and most consonant with the pictorial character of their haunts. Pennant has given a description of these, so excellent, that I must be allowed to quote it here, with only a very few alterations, to make it more exact to St Abb's Head, the place of our visit. This magnificent promontory is a huge insulated mass of trap rocks, whose seaward sides form precipices of vast height, hollowed in many places into caverns, in which the wild pigeons (*Columba livia*) build their nests, and nurture their young in safety, amid the spray of waves that never sleep in rest. In some parts the caverns penetrate far and end in darkness; in others, are pervious, and give a romantic passage by another opening equally superb. Many of the rocks are insulated, of a pyramidal form, and soar to a great height. The bases of most are solid; but in some pierced through and arched,

They are covered with the dung of the innumerable flocks of birds which resort here annually to breed, and fill every little projection, every hole, which will give them leave to rest. Multitudes were swimming about; others swarmed in the air, and stunned us with the variety of their croaks and screams. Kittiwakes, sea-mews, and black-headed gulls, guillemots, auks, and corvorants, are among the species which resort hither. "The notes of all sea-fowl are most harsh and inharmonious. I have often rested under rocks like these, attentive to the various sounds over my head; which, mixed with the deep roar of the waves slowly swelling, and retiring from the vast caverns beneath, have produced a fine effect. The sharp voice of the gulls, the frequent chatter of the guillemots, the loud notes of the auks, the screams of the herons, together with the deep periodical croak of the corvorants, (and the boding voice of the raven), which serves as a bass to the rest, have often furnished me with a concert, which, joined to the wild scenery surrounding me, afforded, in a high degree, that species of pleasure which results from the novelty and the gloomy majesty of the entertainment¹."

I must not leave this majestic coast, without mention of another of its feathered tenants, the Cornish chough (*Fregilus graculus*), which indeed, was not seen by us on this occasion, but is certainly ascertained to breed in the rocks between St Abb's and Fast Castle. This fact, distinctly mentioned by Bishop Leslie in his history *De Origine Scotorum*, published about 300 years ago², has been overlooked or disregarded by naturalists, who have considered the bird peculiar to the western shores of Britain³; and it is to the Rev. A. Baird that we are indebted for the confirmation of the accuracy of the Bishop's information; and, of course, for showing that the limits usually assigned to the distribution of the chough in this country are erroneous.

Reptiles.—Of the reptiles of Berwickshire, the frog (*Rana temporaria*) and the toad (*Bufo vulgaris*), have met us every where; and, in our excursions to Penmanshiel Wood, and to St Bathans, a viper (*Vipera communis*) was taken; but no communication relative to any of this neglected tribe of animals has been laid before you.

Fishes.—Mr Embleton gave us, at our meeting in December last, a description of a singular individual of the salmon (*Salmo salar*), which had been caught near Coldstream. It was distinguished by being spotted over, in a leopard-like fashion, with pale marks, by having its gill-covers beautifully streaked with red lines, and by leather-like fins; and these peculiarities were not the effects of disease, for the fish was in good condition, and perfectly sound. At the same meeting I presented to the Club a list of the less common fishes found on the coast of Berwickshire, of which list the most remarkable, for their rarity at

¹ Arctic Zoology, i. Introd. p. xii.

² P. 17. Published in 1578.

³ "Inhabits the western side of the island." *Flem. Br. Anim.* 53.

least, were the common tope¹, the starry ray², of which I have had several specimens brought me, the top-knot³, the toothed gilt-head⁴, the sea perch⁵, the basse⁶, the horse mackerel⁷, the fifteen-spined stickleback⁸, which is by no means uncommon on this coast, and is occasionally taken at the mouth of our river during the summer months. Besides these, there have occurred four species, which, in our latest system of British animals, are said to be confined to the "English coast;" and which may therefore be considered as additions to the fishes of the Scottish shores. These are, the greater weaver⁹, the lesser spotted dog-fish¹⁰, the hag-worm¹¹, and the tadpole fish¹². The hag-worm, so remarkable for the peculiarities of its structure, is, according to the testimony of our fishermen, rather common on the coast of Berwickshire; and the size of the specimens I have seen, and I am assured they are not larger than the average, is much superior to what is stated in our systematic works; for, instead of 8 inches, they were 14 and 15 inches in length. Of the tadpole fish, which is one of the rarest British species, and previously known only as an inhabitant of the shores of Cornwall, I had the pleasure of exhibiting to you a living specimen, which had been captured in Berwick Bay. When alive, and when recently dead, the body appeared every where smooth and even; but, after having lain three days on a plate, and become a little shrivelled, there appeared an obscure row of tubercles, running backwards from the pectoral fins, and these pea-like tubercles could be more readily distinguished by drawing the finger over the skin. I would call attention to this fact, because the only good distinction between the *Raniceps trifurcatus*, and *R. Jago* of Dr. Fleming, is derived from the presence of these tubercles; in the former the lateral line is said to be tuberculated above the pectoral fins, in the latter it is said to be smooth: but here we have a specimen which, when alive, exhibits the character of the *Jago*; when dead, that of the *trifurcatus*; and hence, I am induced to think that both are the same animal, having the tubercles more or less prominent and obvious according to the leanness or other conditions of the body.

Insects.—Since no communication has been laid before us relative to the entomology of Berwickshire, it is beyond my province to make any remarks on the subject; but you may permit me to notice one family,

¹ *Squalus Galeus* Lin., *Galeus vulgaris* Flem.

² *Raia radiata* Donov.

³ *Pleuronectes punctatus* Pen.

⁴ *Sparus dentatus* Stew., *Brama marina* Flem.

⁵ *Perca marina* Lin., *Serranus norvegicus* Flem.

⁶ *Perca Labrax* Lin.

⁷ *Scomber Trachurus* Lin., *Trachurus vulgaris* Flem.

⁸ *Gasterosteus Spinachia* Lin., *Spinachia vulgaris* Flem.

⁹ *Trachinus major* Flem.

¹⁰ *Squalus Catulus* Lin., *Scyllium Catulus* Flem.

¹¹ *Myxine glutinosa* Lin.

¹² *Batrachoides trifurcatus* Davies, *Raniceps trifurcatus* Flem.

too beautiful, too generally distributed, and too obtrusive, not to have attracted our attention : I mean the butterfly tribe. Of this, 85 species (including 11 that perhaps may properly be considered as varieties) have been ascertained to be natives of Britain ; and, of these, we have in Berwickshire, only 16 distinct species, or somewhat more than one-fifth of the whole. Four belong to the family Papilionidæ ; nine to the Nymphalidæ ; and three to the Lycænidæ¹. None of the species are esteemed rare by experienced entomologists ; but, in Berwickshire, I never observed the *Hipparchia Semele*, until on our visit to St Abb's Head in July last, where we found this fine active insect in great profusion. The more common *Hipparchia Aegeria*, also, I have seen in one locality only in this country, viz. on the wooded banks of the Eye, below Ayton House, where it may be captured in the months of June and July. The *Pontia cardamines* is likewise a local species with us ; it very rarely occurs in the neighbourhood of Berwick, but appears very soon after passing the village of Paxton, on the road to Swinton, and abounds all along that low tract. It is also common on the road between Swinton-Mill and Coldstream ; but I have not noticed it elsewhere in Berwickshire.

Exannulosa.—Communications relating to the exannulose invertebrate tribes have been made as yet only by myself, but I have now a zealous co-operator in our Secretary, whose situation is peculiarly favourable for the investigation of these intricate and vastly curious creatures, among whose multitudes, it may be truly said, “we meet with forms and structures as varied and unexpected as if they had been the tenants of another planet.” A collection of the zoophytes of the coast was exhibited at an early meeting, which I have since described at length in the *Transactions of the Natural History Society of Newcastle* ; and I flatter myself that no department of the natural history of Berwickshire is now so well known as this, in reference to species : their habits and economy require for illustration a person of more uninterrupted leisure. Our Actiniæ, or animal flowers, on which I read a separate paper, are remarkably interesting. I know no marine worm that for beauty and elegance can be compared with the *Actinia plumosa* ; and such of you as had the opportunity of seeing the specimen that I preserved for some time alive, will recall with pleasure the splendid spectacle. *Actinia Tuedia* was still more interesting, to me at least, for the species was new to naturalists, and, fortunately, possessed characters that distinguished it decidedly from every other. The *Actinia coccinea* and *viduata* of Müller are also denizens of our shores ; but the first was considered as a smooth variety of the *senilis*, and the other a small streaked variety of the *equina*.

¹ a. Papilionidæ : *Pontia brassicæ*, *P. rapæ*, *P. napi*, *P. cardamines*. b Nymphalidæ : *Vanessa urticæ* ; *V. Atalanta*, *Cynthia cardui*, *Hipparchia Aegeria*, *H. Semele*, *H. Megæra*, *H. Janira*, *H. hiperanthus*, *H. Pamphilus*. c. Lycænidæ : *Lycæna Phlæas*, *Polyommatus Alexis*, *P. Argus*.

A passing notice of some invertebrates which I have described and figured in the *Magazine of Natural History* for the present year [1832] may perhaps be excused, since the subjects of them were procured in Berwick Bay. The *Praniza fuscata* is a minute crustaceous insect, and the *Eolis rufibranchialis* a molluseum new to naturalists; and the *Planaria cornuta* appears to be likewise an acquisition to the list of British worms. They afford a small sample of the many remarkable invertebrates that inhabit our shores, and which have found, to this day, no one willing to make known their singular forms and structure, that, through the medium of his intelligent creature, they may praise their Creator, and evidence still farther the endless variety in his works and wisdom. "Let the heaven and earth praise Him," says the Psalmist, "the seas, and every thing that moveth therein."

Plants.—I turn now with pleasure to the vegetable kingdom; for here I have to speak of others' discoveries, and not of my own. It might, perhaps, be presumed that, because a flora of the district had been so recently published, there was little here to reward the student; but the fact is greatly otherwise; and I esteem the numerous discoveries which have been made of species, and of new stations for the rarer ones, as a proof of the utility of our Club; for the zeal which led you on was surely kept alive by the knowledge that there were around you some who interested themselves in your researches, and were ready to give you their meed of approbation and applause. The sternest stoic of us all, it has been observed, wishes at least for some one to enter into his views and feelings, and confirm him in the opinion which he entertains of his favourite pursuits.

Since the publication of my *Flora of Berwick*, there has been added, exclusive of some naturalized or recently imported species, to the wild plants of Berwickshire, 20 dicotyledonous, 8 monocotyledonous, and 18 cryptogamic species, the names, stations, and discoverers of which are inserted in your minutes. By much the most interesting of these, whether we consider it in reference to its beauty or rarity, is the *Saxifraga Hirculus*¹ discovered in the parish of Langton, by our ingenious colleague, Mr Thomas Brown. Only two stations for this saxifrage have been recorded in our British floras, and both are in the south of England; so that Mr Brown has had the good fortune—and good fortune never waits but on the industrious and intelligent—to make one of the most interesting additions to the Flora Scotica that has been made of late years. Another addition to that flora is due to Misses Bell and Miss Hunter, who have found, for the first time in Scotland, the *Sison Amomum* growing at the Hirsell Lough, near Coldstream; and these ladies deserve our best thanks for their contributions, and still

¹ "Hirculus, a diminutive from *hircus* a goat. Now look at the hair which beards our plant, and you will see why Linnæus calls it a 'little goat.' It is just like that happy playful fancy which he possessed so remarkably."—*Mr Brown, in litt.*

more for their devotion to botany ; as their example and success cannot fail to recommend it powerfully to popular attention. The *Hieracium aurantiacum*, the discovery of Miss Hunter ; the *Hieracium molle*, and *Carex fulva*, both detected, in the first instance, in Berwickshire, by Mr Brown ; the *Hypnum stramineum* (in fruit), another of his interesting additions to our list ; and the *Lathyrus sylvestris*, and the *Carex distans*, lately discovered near Berwick by Mr Dunlop, deserve to be particularised on account of their rarity : the *Pulmonaria maritima* restored to our shores by the researches of the Rev. J. Baird and Mr Carr, and the *Myosotis sylvatica* of Langton woods, are preeminent for their beauty ; and the *Chenopodium urbicum* is interesting as the subject of a strange story, which purports that this weed could by cultivation be turned into a real strawberry, and relative to which there is a curious letter from the hapless Josephine to her gardener, in her lately published *Memoirs*, for a knowledge of which, as of the plant itself, we are indebted to Mr Embleton.

While, on the one hand, the Scottish flora owes two good additions to this Club ; on the other, it has contributed two also to the floral catalogue of Northumberland ; and both of these are the discoveries of our Secretary. It was long believed that the vernal squill was peculiar to the western coasts of England ; but the discovery of it by the Rev. A. Baird on the coast of Berwickshire removed this their peculiar ornament and boast ; and Mr Embleton has extended its eastern rage, for he finds it in abundance at Dunstanborough Castle. *Aspidium Thelypteris* is the other new Northumbrian plant ; and it is not a little curious that this fern, which is stated by Dr Hooker to be abundant in Scotland, should not be found at all in Berwickshire, and is so rare in the north of England that it has escaped the notice of the many acute botanists who have botanised there, until this late date, when Mr Embleton drew it from its lurking-place in Learmouth bogs, on the very verge of the kingdom.

May I urge those members of the club who devote themselves more exclusively to botany, to continue the researches which have been so productive during the past year ? for the field is not exhausted so long as there remains a corner of the county unexplored ; and there are, I ween, not a few

———“spots that seem to lie
Sacred to flowerets of the hills,”

where no one has yet wandered, and where no one will wander, “save he who follows nature.” There is too much to learn of the habits and properties of our common plants ; and I may mention, as an illustration of the remark, the observation which was made on the butterwort (*Pinguicula vulgaris*) during our excursion to Cheviot. It was then accidentally observed, that, when specimens of this plant were somewhat rudely pulled up, the flower-stalk, previously erect, almost immediately began to bend itself backwards, and formed a more or less

perfect segment of a circle ; and so, also, if a specimen is placed in the botanic box, you will in a short time find that the leaves have curled themselves backwards, and now conceal the root by their revolution. Now, the butterwort is a very common plant ; yet I am not aware that this fact of its irritability has been ever mentioned.

Geology.—In illustration of the geology of the county, a very elaborate paper was read to us, at an early meeting, by our zealous colleague, Dr Thomson. He has described, in a clear and interesting manner, the geological structure of the parishes of Eccles, Greenlaw, Polwarth, and Longformacus ; and thus has made a valuable addition to the sketch of the geology of Berwickshire which Mr Baird has given in the introduction to my *Flora*, and which had more peculiar reference to the eastern parts. I feel myself unqualified to estimate the merits of this paper ; nor is it necessary to enter into any analysis of it here, since it has been printed in the last number [September 1832] of the *Magazine of Natural History*.

Such, Gentlemen, is a rapid indication of the results of our first year's exertions ; and, in my opinion, they do not discredit, but rather justify, the expectations of those who moved the institution of this Club, which, I doubt not, will work still more efficiently in future years. But, when I estimate the advantages of our association by the acquisitions it has made to the natural history of the county, I do it great wrong ; for I hold it to be more useful, as affording a point of rendezvous for the naturalists of the district, where they may cultivate a mutual acquaintance ; where they may talk over their common pursuit and all its incidents ; where they may mutually give and receive oral information ; where each may nourish his neighbour's zeal ; where we may have our "careless season," and enjoy "perfect gladness," and, assuredly the good feeling and humour which have hitherto characterised, and will continue to characterise, our every meeting, vindicate me in assigning, as the distinctive character of this Club, its social character.

I cannot, I must not, conclude this address, without an expression of, I trust, our united gratitude to the Preserver of all and the Giver of all good. That fatal disease which has walked over the length and breadth of the land, with fear in its front and mourning in its rear, has not left this county altogether unvisited ; and we cannot yet think of its ravages in the place where we are now assembled, without deep feelings of pity for the loss sustained by the survivors, and without gratitude that here its desolating course was stayed.¹ No member of the Club has been removed by death ; neither has misfortune visited any of us, save only one, who has been afflicted with a severe and lingering sickness, and has, in consequence, been hindered giving us

¹ A very few cases of Cholera subsequently occurred in different parts of Berwickshire ; and the disease visited Berwick, Tweedmouth, and Spittal with considerable severity.

that attendance and assistance which none was more willing and none more able to give.

Gentlemen, it is unnecessary to add any plea to induce you to continue your efforts in favour of this Club. The pleasure attendant on our pursuits is so pure and genuine, and so various, that I cannot fear that any one who has fairly entered into their spirit will turn him away. The best argument, indeed, I know in favour of our studies is derived from this fact; for the Deity has never affixed pleasure (I mean, a pleasure which the conscience approves, and which the memory delights ever and anon to recall) to any sublunary pursuit that is unsuitable to the dignity and condition of man. When the conscience utters her still voice to reprove or condemn, it is time to desist, and leave the path we are following, however gaily it may be strewn; but where she approves, there let us follow, certain of reward. And who among naturalists ever found the fruit of his study turn ashes in the enjoyment? Nor can it be: for what our internal monitor approves, the Scriptures also commend, and send us for instruction to the meanest things, to the ant and to the lilies of the field; and bid us seek out His wonderful works, and to tell of them; and thence borrow their moral lessons; and call upon us to praise the Creator, in "his contriving skill, profuse imagination, conceiving genius, and exquisite taste; in his most gracious benignity and most benevolent munificence," through his creatures, from the creeping things of the sea even to his behemoth and leviathan.

Address read at the Second Anniversary Meeting of the Berwickshire Naturalists' Club, held at Dunse, September 18, 1833. By the Rev. A. BAIRD, President.

Of all earthly pursuits and acquisitions, that of knowledge has ever been considered, by rational and civilized beings, as the most important, dignified, and honourable. According, indeed, as men are destitute or possessed of this, we are generally disposed to rank them in the scale of humanity: For, as it is this which, more than anything else, distinguishes one man from another, so it is also this which gives to one an influence and an authority which another, who is destitute of it, let his external advantages be what they may, can never possibly command.

But, if knowledge in general be thus excellent and desirable, there is one particular species of it which must surely, in an especial manner, recommend itself to every man of sentiment, of feeling, or of observation. The knowledge we allude to is the knowledge of nature,—the knowledge of the earth we tread on, with all its varied tribes of animated existence, and all the interesting phenomena presented by its

inanimate objects,—the knowledge, in short, of that fair world which is destined to be the present habitation of our species, and of those wondrous works whereby the great Creator so conspicuously manifests himself to his creatures; and whereby, likewise, is so clearly shewn his great and glorious character. Such a knowledge, we say, must surely appear of all others (religious knowledge excepted), not only as the most interesting, but also as the most reasonable and the most adapted to our present situation; and well, therefore, has it obtained the name of Natural Knowledge.

But it is not my present purpose either formally to enumerate the advantages of natural history, or to give an answer to the question which has so often been asked, Of what importance, or of what avail, are the pursuits of the naturalist? That question has often been already most satisfactorily answered, and, however interesting or important might be its discussion in some quarters, it fortunately is not necessary in our present circumstances. We are already sufficiently convinced both of the utility and importance of such pursuits as those for which this Club was instituted; and even though this utility were less capable of being proved than we conceive it is, we are sufficiently satisfied with the simple pleasure which the following of such pursuits affords, and with the simple information and the rational amusements which we thence derive.

The advantages to natural science in general of such an institution as the Berwickshire Naturalists' Club, must be equally obvious without attempting a formal statement or investigation. Our labours are limited to a certain district,—we have a distinct and a specific field for exertion,—and we are thus led more minutely to examine into Nature's works and Nature's wonders, as well as more regularly to record our observations, than if our field of examination were more extensive, and our object were more general and undefined. There is, besides, the very useful spirit of honourable competition to stimulate our exertions, and, as the reward of these exertions, there is the pleasure and the satisfaction which, we know, awaits even our most trifling contribution to the general stock of knowledge.

When these, and many other advantages, which will readily suggest themselves, are considered, it is not unreasonable to expect from the exertions of such a body, many interesting discoveries and important additions to the natural history of our country, and many curious facts affecting the state of natural science in general, which, but for the establishment of such an institution, had remained in darkness and obscurity. Nor, as far as regards the Naturalists' Club of Berwickshire, are we disappointed in these expectations; an institution, the second anniversary of which we are now assembled to celebrate,—an institution which, from its first formation, has been daily increasing both in numbers and respectability, and the labours of which, we are proud to say, have been neither insignificant nor unsuccessful. It belongs

not to me, as a member of this society, to celebrate its praises ; but it certainly belongs to me, in the honourable situation I now hold in it, to congratulate you, as I do most cordially, on its increasing prosperity, When such an institution was first proposed, it certainly was hoped, and fondly hoped, that it might prosper, and that we might do something towards the elucidation of the natural history of this interesting county ; but even the most sanguine of its original promoters could hardly have anticipated that its establishment should have been so cordially welcomed, and that it should have excited an interest so general and so great. It is, therefore, with no ordinary satisfaction that I either contemplate the present list of our members, or that I turn to the review of their labours since the celebration of our last anniversary.

These labours during the past year, though hardly perhaps so interesting, in some respects, as those of the preceding one, have, nevertheless, been far from unimportant. In some departments, indeed, they have been even more satisfactory. The most numerous contributions have been those of Dr Johnston : To our Secretary we are also indebted for various interesting communications ; while to Messrs Selby, Mitchell, Brown, W. Baird, and Dr Thomson, we are under additional obligations. But these contributions will be best enumerated by taking a brief review of the transactions of our several meetings during the past year.

And of these the first we have to notice is the Anniversary Meeting held at Coldstream in September last,—a very pleasant meeting, and at which many interesting communications were read. The day was spent in examining the Hirsle Woods, Birgham Muir, and Leithtillum, and Hirsle Lochs ; and to those who were present at this meeting, I need not recall either the very agreeable nature of the excursion, or the beauty of the scenery we were so often called upon to admire. Nor need I recall the pleasure with which we listened to our President's address on leaving the chair which he had filled so ably—a pleasure, however, which prevented us not from duly appreciating the value and importance of various other papers which were laid before us. These were, 1. A notice of a Merlin (*Falco Esalon*) shot near Blannerne, on the Whittadder, by Mr Dunlop. 2. Notice of the occurrence of *Grantia nivea*, Fleming, on the coast near Embleton, Northumberland, by Mr Embleton. 3. Notices of plants hitherto unnoticed in the district, by Messrs Dunlop and Brown, and Dr Johnston. 4. An account of the Birds observed during the excursion at St Abb's head in July, by P. J. Selby, Esq. 5. Cases of children poisoned by the seeds of Laburnum, by Dr Johnston. (See Mag. of Nat. Hist. v. 6. p. 74.) 6. A paper on the Geology and Botany of the coast of Northumberland, between Bamborough and Dunstanborough Castles, by Mr Embleton. 7. A list of the Zoophytes of the same coast ; and a Meteorological Table from April to August, by Mr Embleton.

The next meeting of the Club which we have to notice was held in the month of December last, at Berwick-upon-Tweed,—a season of the year which suits not distant members, and when, consequently, our meetings must generally be expected to be thinly attended. Yet, was the meeting far from being destitute of scientific interest. In particular, we notice a very pleasing paper by Dr Johnston, giving a list of the more rare and valuable plants observed at the previous meeting at Coldstream, in which, among many others enumerated, we notice, as perhaps the most interesting, the *Agaricus applicatus* of Withering; a plant not mentioned by Dr Greville in his Flora Edinensis, and which, therefore, may be considered as a fresh addition to the Scottish Cryptogamic Flora. In the minutes of the same meeting, we find recorded the discovery of the *Mentha sylvestris*, by Mr Dunlop, at Blanerne, on the Whittadder; while our zealous botanical contributor, Mr Brown, among other good plants, gives us the *Calicium sphærocephalum*, *Parmelia caperatus*, *Vaccinium Oxycoccus* or Cranberry, and *Endocarpon Weberi*, forming altogether a valuable contribution to the botany of Berwickshire. At the same meeting, Dr Johnston communicated a list of the Echinodermata of Berwickshire, a very curious and interesting class of Marine Animals, the species of which now existing on the British coast appear to be few in number, though, in former times, they seem to have been more abundant and prolific. Belonging to the third family of this order of animals, Dr Johnston notices in particular one animal, of which he has made a new genus under the name of *Flemingia muricata*, in honour of the Rev. Dr Fleming, who has done so much to remove the obscurity under which the species lay previously to the publication of his History of British Animals. The individual thus added to our marine animals has been presented, by its discoverer, to the British Museum, where it is now deposited. A notice of an Albino family by Mr Embleton, and a continuation of his Meteorological Table for the preceding three months, concluded the business of this meeting.

The third meeting of the Club was held at Cockburnspath, on the 3d Wednesday of April 1833,—a season when the naturalist begins once more to look around him with new hope and interest, and when nature, after the gloom and the repose of winter, begins once more to array herself in her robes of cheerfulness and beauty. The peculiarly backward state of the season, however, prevented the Club from making any very remarkable additions to the natural history of the county, and tended not a little to damp the expectations and the hopes which, both the return of spring and the natural beauty of the scenery of the neighbourhood had excited. Still, however, notwithstanding the heavy showers, and the unusual coldness of the wind, the meeting was neither without enjoyment nor interest. Dunglass Dean at all events, was visited, and miserable indeed must be the day which will render it unworthy of unbounded and unmingled admiration. Occurring in this

beautiful station, two new plants, new I mean to the Flora of Berwickshire, were gathered by the Rev. John Baird. The one was the *Chrysosplenium alternifolium*, occurring mixed with the more frequent species,—*Chr. oppositifolium*; the other was the *Marchantia conica*, growing on moist banks in considerable abundance, and in fine fruit. Various species of land shells were also gathered in the sheltered recesses of the dean. Among the communications read at this meeting, we have to notice, with much pleasure, several interesting discoveries by our indefatigable member, Dr Johnston. The first of these is the addition of a rare fish to those previously described by him, as occurring in Berwick Bay, the *Syngnathus aequoreus* of Montagu. The second is a new Zoophyte, a species of the genus *Plumularia*, which its discoverer, with a propriety that will be felt by every member of the Club, has named the *Plumularia Catharina*. The third is the *Conferva coccinea* of Dillwyn, many specimens of which had been procured in Berwick Bay during the past winter, and which, in the words of its discoverer, “forms a beautiful addition to the list of our marine algæ.” These communications were succeeded by a list of the Cirrhipedes of Berwickshire, also by Dr Johnston; and an interesting account by Mr Embleton of the *Trigla lavis*, or smooth gurnard-fish, which was cast ashore at Newton, after a severe storm, from the south-east. The account of this fish was principally interesting, from the circumstance that, hitherto, it has been chiefly observed on the coasts of Devonshire and Cornwall, and that, in all probability, a further examination will prove this species and the *Hirundo* to be the same. At the same meeting, Dr Johnston mentioned that he had lately received from the Rev. Mr Campbell a specimen of the pochard duck (*Anas ferina* Linn.) shot near Coldingham Loch;—while the pleasure of the meeting was still farther increased by the presence of Captain Alexander, 42d Royal Highlanders, a traveller of some celebrity.

The first summer meeting of the Club, which took place at Coldingham on the 19th of May, was distinguished by a heavy rain, which, with occasional intermissions, lasted the whole day, and lessened very much the comfort, as well as hindered very materially the success, of the expedition. Yet some plants of considerable rarity, several birds, and many insects and worms, were observed and collected;—while by those who then for the first time beheld the splendid scenery of “the Head,” the excursion, I am sure, with all its drawbacks, will be long remembered with delight. The loch, so pleasing in its general character, and so remarkable for its situation;—the wide spread moors so finely undulating, and so elegantly carpeted with their thousand different wild-flowers;—the magnificent precipices which form the mountain promontory of St Abb’s, with their thousand times ten thousand feathered visitants; and far beneath, and wide around as eye can stretch, the dread expanse of ocean,—these, altogether, form a scene than which a richer in natural phenomena, or one more striking for

its grandeur and sublimity, is scarcely to be met with in our island, and sure I am that, round these shores, a plentiful harvest yet awaits our exertions. The plant of perhaps the greatest interest which this excursion afforded, was the *Poterium Sanguisorba*, a plant new to the Berwick Flora, although in many situations by no means uncommon. For this addition to the botany of Berwickshire we are indebted to Mr Mitchell. The most important communications read at this meeting were, 1. A notice by Mr Embleton of the plants collected and observed in the last excursion. 2. A notice of the shells collected during the same excursion in Dunglass Dean, by Dr Johnston; and, 3. A valuable and very ingenious paper by Dr Thomson, viz.; a Register of the Barometer kept at Eccles Manse, during the year 1832; from which the author deduced many curious facts and various conclusions of considerable importance. From the interest with which this paper was listened to, it is hoped that the example set by Dr Thomson, will have led others to institute a similar series of observations, and that, from different situations in the county, we shall have, from time to time, reports connected with this interesting department. At the same meeting were also read a notice by Mr Brown of two plants new to the Flora of Berwickshire; and a notice by Dr Johnston of the Great Northern Diver (*Colymbus glacialis*) being caught in a salmon-net on Spittal shore, 11th May 1833.

The 17th of July, when the Club met at Holy Island, was a day of unusual beauty. With regard to the excursion of the day, I unfortunately, can say little, not having been present; but we can all form some idea of its pleasure, when we know that the scene of the excursion was Holy Island, and the day one unrivalled for its splendour.

On looking over the minutes of this meeting, it appears to have been one of unusual business. Among other papers, we observe a notice by Mr Embleton, of the plants observed during last excursion;—a very interesting and valuable notice by Mr Selby, entitled, “Ornithological observations made during the excursions of the Club in April and June;”—and the announcement to the Society by Mr Mitchell, of two plants new to the Berwick Flora; one, the magnificent *Osmunda regalis*, observed at the *Routin Linn*, near Fenton in Northumberland; the other, a species of mint, which solicited particular attention, and which has since been ascertained to be the *Mentha crispa* of Linnaeus. In the minutes of the same meeting, we observe an excellent paper by Dr Johnston, entitled, “A list of the Invertebrate Animals observed during the walk from Coldingham to Coldingham Loch, St Abb’s Head,” &c., June 19th, in which he notices, as new to Berwickshire, the *Helix cellaria* and *H. pura*, *Planorbis fontanus*, and *Pisidium pulchellum*; and, as an addition to the marine botany of Berwickshire, the *Sphacelaria cirrhosa* of Greville. At the same meeting was also read an interesting and elaborate paper, by Mr W. Baird, on that very curious animal the *Gordius aquaticus* or hair-worm, an animal by no means uncommon,

but the structure, the habits, and the general history of which have hitherto been very little attended to. The public business of the day was concluded by a paper by Dr Johnston on the failure of the Potato crop during the present year,—in which some probable reasons are assigned for the fact, but which, we suspect, is still in a great measure unexplained, and still, therefore, open to inquiry.

Such, then, is a very hurried and, I fear also, a most imperfect, recapitulation of the labours of our Club during the second year of its existence,—a recapitulation indeed so imperfect, that had I not to plead, as an apology, a considerable absence from home, and continued professional engagements since my return, I should feel almost ashamed to present it.

I conclude with only one observation. The preceding review shews that we have done something, and that the Club has not been instituted in vain. It also shews that the field of our labours is an interesting one, and that, though a little has been accomplished, a great deal yet remains to be done. Let us then continue our researches with vigour: let us stroll along our splendid shores; let us penetrate into the recesses of our woods and deans: let us ascend our mountain sides, and, with unwearied feet, let us follow the meanderings of our rivers and our babbling brooks! There at least health and peace and rational enjoyment attend our footsteps; and, while thus occupied, however the vulgar or the ignorant may marvel at our joy, we can tell them that, with whatever eyes they may contemplate Nature, yet there are others who can

“ Find tongues in trees, books in the running brooks,
Sermons in stones, and good in every thing!”

Notice of the Birds observed in the Neighbourhood of St Abb's Head, on July 18, 1832. By P. J. SELBY, Esq., F.R.S.E., F.L.S., &c.
(Read on the 19th September 1832.)

PASSING without further observation the various flocks of sparrows and other Fringillidæ that enliven the shades of our highways, or are to be seen within the precincts of all the farm-steads and villages, I commence with the rock or shore pipit (*Anthus aquaticus*). This species, which is strictly confined to our rocky coasts, I observed to be plentiful near the village of Northfield, and indeed along the whole of the coast we examined. In size it exceeds both the common and the tree pipit, (*A. pratensis* and *arboreus*). The claw of the *aquaticus*, though shorter and more curved than that of the *pratensis*, is longer and less incurved than that of the *arboreus*. It feeds upon marine insects and worms, and is a permanent resident. The marten or martlet (*Hirundo urbica*) next attracted my attention from the unexpected numbers in which it was seen hawking about the face of the cliffs, a habitat in point of situation very dissimilar to those in which we are accustomed to observe

them, such as the eaves of houses or the upper angles of windows. The nature and structure of the rock (porphyritic amygdaloid), which presents a broken face, and a succession of projecting ledges, affords it however, peculiar facilities for the site and security of its curiously constructed nest of clay; and the offal, dung, &c. of the numerous sea birds, cannot fail to generate an abundance and constant succession of insect food. As we walked along the heights I observed the kestrel (*Falco tinnunculus*) hovering in his characteristic manner in search of prey, and I have little doubt, but that he finds a secure site for his eyrie in some of the adjoining cliffs. Three or four carrion crows (*Corvus corone*) were also observed upon the rocks, but too wary to admit of our approach within gun-shot; the eggs, and young of the sea-fowl, had, in all probability, attracted these depredators to such an unwonted locality. Three ravens (*Corvus corax*) the largest and noblest species of the genus, were also disturbed by our approach, and after soaring around, and attaining a considerable elevation, moved inland, uttering at intervals their loud and raucous croak. Before I enumerate the sea-fowl or aquatics, I must not omit the rock-pigeon (*Columba livia*), which inhabits and breeds in the numerous caves which perforate the rocks in different directions. This species is the original stock from which the various varieties of our common dovecot pigeons are derived; it is found in similar situations upon the British coast, but never inland—the bird with which it was confounded (*Columba Œnas*) being perfectly distinct, and possessing habits approaching more closely those of the cushat or ring-dove (*Columba palumbus*). Upon the ledges of the rocks the guillemots (*Uria troile*) and razor-bills (*Alca torda*) were seen in great numbers, ranged in order, tier above tier, and looking at a distance like armies of pigmies; these upon the least alarm utter their peculiar curring kind of note, which, when mixed with the screams of the sea-gull and kittiwake, and heard from a distance, or softened by the murmur of the waves, produces a wild, though not disagreeable, species of concert, well according with the nature of the scenery which surrounds them. These birds each lay a single egg, of a large size and peculiar shape, being broad and round at one end, and tapering rapidly at the other, a form that prevents it from rolling or moving to any distance, even when placed on an inclined plane. The puffin or coulterneb (*Fratercula arctica*) perhaps as well or better known to us by the name of Tommy-Nody, also finds appropriate holes wherein to deposit its eggs. It does not appear, however, to be numerous, as only two or three individuals were seen during the excursion. This bold headland is also the great breeding station of the *Larus canus* or common sea-maw; it effects the upper ledges, and recesses of the precipices, and was observed in great numbers, but so shy as not to be approached within gun-shot. The *Larus rissa*, or kittiwake, is also numerous, but does not breed in company with the other; selecting in preference the small projecting angles, which barely admit of room for the reception of their eggs and young. As we returned seaward in the

boat, several green cormorants (*Phalacrocorax cristatus*) were seen perched upon the pinnacles of the smaller isolated rocks, surveying with keen and watchful eyes our progress; and always too much upon the alert to permit us to approach within gun-short. The common cormorant (*Phalacrocorax carbo*) was also seen occasionally flying past, but at a considerable distance from the shore. On our return, and to the south of Northfield, a small flock of the young of the *Larus ridibundus*, black-headed or pewit gull, were observed: these in all probability had come recently down from Dunse or Pallinsburn, both great breeding stations in this district.

Observations on the Birds observed in the neighbourhood of Coldbrandspath in April, and those at St Abb's Head in June, 1833. By P. J. SELBY, Esq. (Read July 17. 1833.)

THE cold ungenial weather which prevailed till the end of April retarded the arrival of our summer visitants, at least ten days or a fortnight beyond the usual average period of their appearance; and, from this cause, on the day of our excursion to Coldbrandspath and Dunglass, which, it will be recollected, took place on the 16th of April, not a single warbler or migratory bird came under our notice of any species. This, indeed, I anticipated from the backward state of vegetation, as I have for many years remarked, that the arrival of our songsters is regulated by, or rather accords with, the first appearance of particular flowers, or the bursting of the buds of certain trees. Thus, the willow-wren (*Sylvia Trochilus*) and black-cap (*Curruca atricapilla*) are never seen till the larch becomes visibly green. The greater petti-chaps (*Curruca hortensis*) and wood-wren (*Sylvia sibilatrix*) are considerably later, making their appearance with the bursting of the elm and oak. The spotted fly-catcher (*Muscicapa grisola*) is seldom seen before the oak is partly expanded; and so with respect to the sedge-warbler (*Salicaria Phragmites*), grasshopper-warbler, (*Salicaria Locustella*), and others.

The only bird which attracted notice was the dipper (*Cinclus aquaticus*), which we observed skimming along, and following the various windings of the rivulet which flows at the bottom of Dunglass Dean. This neat and compact bird is the peculiar inhabitant of clear and rapid running streams in hilly or mountainous districts; being of rare occurrence upon the slow and sluggish rivers of the flat or champagne parts of the country. It is one of our earliest and, I may add, sweetest songsters, commencing its lay as early as the latter end of January, or beginning of the following month, and its first brood is generally fledged or able to quit the nest by the middle of May. It dives with great facility in pursuit of its prey, but certainly does not walk at the bottom of the water, as asserted by some writers; the same exertion of the being wings necessary as well to keep it beneath the surface as give it

progressive motion, that we see used by all the natatores and true diving birds. The fry and spawn of fishes, insects, and caddis bait, which is the larva of different species of phryganea, constitute its principal food. To obtain the latter in winter, when the rivers are mostly frozen over, it resorts to such places as remain partially open, as the heads of quick running streams: In such situations on the Annan, Tweed, and other rivers, I have repeatedly seen it dive into the stream from the margin of the ice, remain some time submerged, and again reappear near the same spot, and almost invariably with a prey in its bill, which it leisurely devoured on the ice.

During our excursion to Coldingham and the romantic scenery of St Abb's Head on the 19th of June, besides the birds communicated to the Club last autumn, the coot (*Fulica atra*) was observed upon Coldingham Lough, where it no doubt breeds in the rushes and other aquatic herbage at the northern extremity of this prettily formed piece of water. A large flock of herring-gulls (*Larus argentatus*) was also seen bathing and sporting in it; and these, I afterwards found, had their breeding stations on particular parts of the Head, and the rocky cliffs to the north of it. This species had not been observed during our excursion in July 1832, having taken its departure from those haunts previous to our visit; the common gull (*Larus canus*), which breeds in great numbers on the rock to the south of the Head, being the only species then visible.

Upon reaching the cliffs immediately north of the Head, and where they rise from the sea in fine broken and perpendicular faces to the height of 300 or 400 feet, our attention was attracted by the powerful and hoarse cry of a large species of Falco, two of which were seen soaring and wheeling in the air at a considerable height, immediately in front of us. These I immediately recognised to be a male and female of the *Falco peregrinus* or common falcon. A nearer inspection of the precipice soon discovered to us the cause of their alarm and vociferous outcries, as we perceived two young birds (which the difference of size shewed to be male and female) perched upon a projecting angle of the rock. From their comparative tameness, and the short flights they took, when disturbed, along the face of the rock, it was evident they had but very lately quitted the nest. A shot was obtained at the young female within reasonable distance, and supposed to have taken fatal effect, as it was never seen afterwards, though the smaller bird remained visible as long as we continued on the heights. This eyrie of the peregrine has long been established, and it was from it that the late Mr Baird of Newbyth usually obtained his cast of hawks, for each of which he gave the persons who undertook the perilous task of scaling the precipice one guinea. The castings of these birds were scattered in great profusion upon the tops of the cliffs; some which I examined were almost wholly composed of the bones and feathers of gulls and other aquatic fowl, others were mixed with the feathers of partridges, and the bones of rabbits, and young hares.

Upon a low flat and isolated rock, about 150 to 200 yards from the bottom of the cliff, we observed a flock of green cormorants (*Phalacrocorax cristatus*) busily engaged in preening and drying their feathers. These individuals seemed conscious of the safe and unapproachable station they had selected for repose after the exertion of fishing, as they listened with apparent unconcern, and without shewing any alarm, to the report of our fowling-piece, which was fired off upon the cliff immediately above them. Upon the ledges of the precipices north of the Head, and upon the head itself, the guillemots were perched in great numbers, the females closely pressed together and incubating. Numerous pairs of razor-bills were also conspicuous: these generally select stations a little higher than the guillemots, and keep in distinct pairs, and are easily recognised even at a considerable distance by the form of their head and bill, and the superior blackness of their upper plumage. Several rock-pigeons (*Columba livia*) were also seen upon wing, but, unfortunately, none came within range of shot.

Upon the stony hills round Coldingham Lough and the Head, the smart and prettily marked wheatear (*Saxicola Oenanthe*) was seen flitting from knoll to knoll, and, like its congeners, always alighting on the highest elevation. The whin and stone chats (*Saxicola Rubetra*, *S. Rubicola*) were also observed where whin or furze prevailed; and, in similar situations, the mellow call-note of the grey linnet (*Linaria cannabina*) was repeatedly heard. I may also notice the common occurrence of the rock-pipit (*Anthus aquaticus*) upon the rocks of the coast; and the escape of a large brood of the diminutive wren (*Troglodytes europæus*) from their nest, from the face of one of the highest precipices of the cliff.

Notice of the Trigla lavis or Smooth Gurnard. By Mr R. EMBLETON, Surgeon. (Read 10th April 1833).

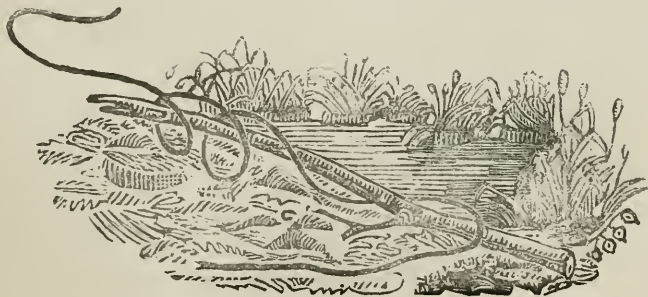
On the 5th of April inst., a very fine specimen of this fish (*Trigla lavis*, Flem. Br. An. p. 215), was cast ashore at Newton-by-the-sea, after a severe storm from the south-east. It is found in great abundance on the coast of Devonshire and Cornwall, but is a very rare visitant so far to the north-east; and this specimen is the only one which has been seen by the fishermen in this neighbourhood, so far as I can learn. It differed, however, in some points, from the description given by Dr Fleming, and seemed to me to hold an intermediate place between the *Trigla lavis* and *T. hirundo* of that author. Its extreme length was $23\frac{1}{2}$ inches. From the origin of the pectorals to the anal-aperture $4\frac{1}{2}$ inches, whilst the pectorals extended rather more than half an inch beyond it. Breadth of the pectorals $3\frac{1}{4}$ inches; circumference of the body immediately at their base, 10 inches. The first dorsal fin

had only 8 spines, differing in this point from both the *lavis* and *hirundo* of Fleming, and the second and third spines were nearly of a length, and about a half inch longer than the first. The second dorsal consisted of 16, anal 15, ventral 6, and pectorals 9, agreeing in these points with the first of Fleming, caudal 18, and lunated. On each side of the second dorsal fin there existed a row of large spines, increasing in size from its commencement to its termination, agreeing here with *T. hirundo*, Flem. At the base of the first dorsal, these spines had completely disappeared, and a rough ridge occupied their place, agreeing here with the *T. lavis*. The lateral line was partly smooth, and partly rough; thus uniting another distinguishing mark of the two species: The colour on the back was of a greenish brown intermixed with red, whilst the sides were of a rich vermilion; studded with spots of pure white. Belly pure white. The pectorals of a deep blue green and red, blended together, and which, when fresh, exhibited a very beautiful appearance. The head and caudal fin were red. Pupil dark green. The membrane of the first dorsal fin was marked with large patches of the same bright vermilion as the sides.

Dr Fleming says that the fishermen on the coasts of Devonshire and Cornwall regard the two species as the same fish. The specimen that presented itself to our notice, seems to have united in it several of the characters which are looked upon as distinguishing the species; and perhaps it may be found, upon a more extended examination, that the one is a mere variety of the other.

Remarks upon the Gordius aquaticus or Hair-Worm. By WILLIAM BAIRD, Esq., Surgeon, H.E.I.C.S. (Read July 17, 1833.)

THIS slender animal, though common enough in our ponds, seems to be one which naturalists have very cursorily or imperfectly described. Even its place in the general arrangement of animals is not properly fixed; and with regard to its economy, little or nothing seems to be decidedly known, though a sufficient number of fables are related of it.



Linnaeus, in his *Systema Naturæ*, places it in his class Vermes, order Intestina; and Müller, in his *Vermium Historia*, also places it in the class Vermes, and order Helminthica, corresponding to Linnaeus' Intestina. Cuvier, however, in his last edition of his *Regne Animal*, places it among the Annelides, animals, it must be observed possessing red blood, and a double circulation of arteries and veins. If its situation in the general system be thus indistinct, it is no less unfortunate in its generic relations, having apparently been frequently, perhaps generally, confounded with the genus *Filaria*. Linnaeus, in his *Fauna Suecica*, amongst several old authors, which I have not been able to lay my hands upon, quotes the curious work, *Historia Naturalis Johnstoni*, for a figure of the Gordius, which by Johnston is called the meer worm. Upon examining this curious work, however, the figure there given is not a correct resemblance of our Gordius, but evidently a *Filaria*; and from this figure being cited by Linnaeus as a figure of the Gordius, it appears probable, that that great naturalist had himself confounded the two genera. Müller, again, in his description of this worm which he calls *Gordius Seta*, mentions "that a variety is found with one extremity bifid, or divided into a fork with obtuse legs." In his description of the species in general, he says, the extremities are of the same colour as the rest of the body, and that one extremity is somewhat sharpened. Now it is evident from this, that his description of the species is of that of a *Filaria*; and that his variety, with a bifid extremity, is in reality the true Gordius: for in all the specimens which I have examined yet, and from different parts of Berwickshire, the tail is universally bifid, the extremities are of a darker colour than the rest of the body, and neither extremity is sharpened more than the other. Smellie, in his *Philosophy of Natural History*, in speaking of the Gordius or Hair-worm, says, that in this country it is harmless; but that in India and Africa it is found to be exceedingly troublesome, insinuating itself under the skin, and producing dangerous consequences. This is the animal commonly known by the name of the Guinea-worm, which is a species of *Filaria*, and Smellie evidently confounds the two genera together. In a paper by a Mr Bird, in the first volume of the *Transactions of the Medical and Physical Society of Calcutta*, the Guinea-worm is attempted by him to be proved a species of Gordius, most probably, he says, the *Gordius argillaceus*. This is one of Müller's species, I believe, and I have already shewn my reasons for believing his description of the Gordius to be mixed or confounded with that of a *Filaria*, which may account for Mr Bird falling into this mistake. The fabulous account of this animal is perhaps the most interesting part of its history. It is almost universally believed in this country, by the lower orders especially, as produced by horse hairs being dropped into the water; and it is not unusual to meet with people, who, with all the confidence of honest Gerard, in his account of the Barnacle Goose, declare that they themselves have proved the truth of

this belief, by actual experiment : that they have thrown horse hairs into the water, and actually seen them come forth living Gordii. No later than last week, an intelligent farmer assured me with much gravity and sincerity, that he had actually seen horse-hairs placed in the water and become living worms ; but when pressed upon the subject, his belief arose from his having seen those hairs when taken out of the water, and placed upon the palm of his hand, curl up like worms. When the learned herbalist, Gerard, can confidently state, that he has seen the Barnacle Goose spring forth full fledged, and in all his plummy glory, out of the diminutive barnacle shell, we need not so much wonder at the confident simplicity of our less learned rustics, with regard to an animal which possesses certainly very much the appearance of a horse hair. Linnæus, in his *Systema Naturæ*, mentions this opinion also, so that it appears it is not confined to this country alone. It is reported also of the Gordius, that if handled without sufficient caution, it will inflict a wound at the end of the fingers, and produce whitlow. Linnæus, in his *Fauna Suecica*, says, that the rustics of Smolandia believe that the bite of this worm causes the whitlow, and that they call the whitlow in their language Onda Betet, and that they give the same name to the worm itself. But though they believe thus much, he says, they are ignorant whether it enters the body like the Guinea-worm. He farther states that these rustics have a method of curing the whitlow, produced by the bite of this worm, by making an incision with a knife, with which they had previously divided the animal into minute segments.

The serpent-like appearance of the worm, with the natural credulity and love of magnifying the dangers of an animal, the nature of which they are not acquainted with, will sufficiently explain these fables.

Linnæus further mentions, as the opinion of these rustics of Smolandia, that if this worm be cut into pieces, each separate portion will, polype-like, become a perfect animal. On Saturday the 29th of June, I cut one of these animals into six pieces, and left them in the saucer, in which the worm had previously been lying, for twenty days. On Wednesday, July 3, the intermediate portions between the tail and the head were found to be dead, having lived up to that day, but no appearance of the slightest reproduction was observable. The two extremities on the 4th were still alive, and shewed considerable powers of life, but not the slightest symptom of reproduction was observable in either of them.

When full grown, the Gordius appears to be about 10 inches in length : it is round and filiform, considerably resembling a horse hair or hog's bristle in diameter and general appearance ; the body is of equal size and diameter throughout its whole length, and has its two extremities darker than the rest of the body, which is generally of a brown colour. In all the specimens which I have examined the tail is bifid, being divided into a fork, with very short obtuse legs. The

skin is marked with numerous fine transverse rings, which require the aid of the microscope to be made visible; and when placed under a high magnifier is seen to be beautifully and finely reticulated, producing in the sun's rays a play of colours. This ringed and reticulated appearance is well seen in parts which have become dry. The skin is very thin, and, when cut transversely, shews that internally the body is composed of a white medullary substance, in the centre of which may be seen the intestinal canal. The whole organization appears, as far as can be made out or seen, to be very simple; so simple, indeed, says honest Müller, that "even by the aid of the microscope, nothing more fully can be made out of it." The same author says farther, no appearance of a mouth can be made out, though the very celebrated Plancus represents the mouth fimbriated. Plancus' work I have not been able to see to compare his representation with what I have seen myself, and no author that I have seen describes it as being visible; but though all appearance of a mouth escaped certainly for a time my utmost efforts, at length, by means of the powerful microscope belonging to Sir John Hall, Bart. of Dunglass, and after repeated examinations, I discovered at the very extremity in several specimens, a round aperture, having somewhat of a fimbriated margin round it. In other specimens in which the round aperture was not visible, I could distinctly see the white medullary part of which the internal part of the animal is composed, filling up the aperture, and in many a puckering was distinctly seen, as if the mouth were closed. Once, and once only, I distinctly, as I thought, saw the puckered appearance give way while under the microscope, and the round aperture open to its full extent. This opening, therefore, I have no doubt is the mouth of the animal; and as upon repeated examinations no other opening could be seen in any other part of the body, I conclude that this, as in some other animals, may "serve the purposes both of mouth and anus, or that this latter aperture remains to be discovered.

Analysis of a Mineral from the Tweed. By DR THOMSON. (Read December 21, 1831.)

The mineral of which the analysis is subjoined, occurs on the banks of the Tweed, near St Boswell's, in connexion probably with the sandstone of that district. It is extensively used as a slate pencil in the neighbourhood where it is found, and resembles indurated claystone.

Colour milk white: opaque: lustre dull: sectile: hardness 2.5: specific gravity 2.558. Before the blowpipe *per se* becomes blue and brittle. Fuses with carbonate of soda into an opaque bead; with borax and salt of phosphorus into a transparent glass.

Its constituents are—

Silica . . .	44.300 = 2.2 Atoms.
Alumina, . .	49.400 = 1.7
Lime, . . .	0.755
Magnesia, . .	0.500
Water, . . .	13.500 = 1.2

99.455

Considering the lime and magnesia as accidental, the formula will be $Al^{\frac{1}{2}}S^2 \times Aq$, or bi-subsesqui silicate of alumina.

From the locality where the specimen analysed was procured, the mineral may be termed *Tuesite*.

Barometrical Register kept at Eccles Manse during the years 1832-33.

By ALEXANDER S. THOMSON; with observations by ROBERT D. THOMSON, M.D.

The Barometrical diurnal heights were registered at 10 A. M. regularly. The mean altitudes for the several months of the year 1832-33 are collected in the following table:—

	1832.	1833.
January,	29.509	29.649
February, . . . . .	.486	28.969
March, . . . . .	.091	29.344
April, . . . . .	.808	.120
May, . . . . .	.829	.414
June, . . . . .	.734	.388
July, . . . . .	.836	.824
August, . . . . .	.486	.490
September, . . . . .	.848	.234
October, . . . . .	.494	.142
November, . . . . .	.458	.130
December, . . . . .	.274	28.960
Mean,	29.571	29.305
Corrected for Temperature,	29.523	29.257
Mean,	29.390	

The subjoined observations are deduced from an inspection of this register:—

1. The lowest station of the mercury during 1832 was 28.6 on the 5th of October, to which point it fell the same day from 29 inches; and this rapid subsidence was followed by a heavy rain, which continued for several days.

The greatest elevation of the barometer was 30.1 inches, which it attained several times, but more especially on the 10th February and 21st and 22nd September.

The range of the barometer for 1832 is thus found to be one inch and a half. The lowest boiling point of water was therefore $209^{\circ}.32$ Fahrenheit, and the highest $212^{\circ}.17$; the mean for the whole year $211^{\circ}.08$, the range of boiling point being $2^{\circ}.85$.

2. A fall of $\frac{3}{100}$ was frequently attended with a shower, or even heavy rain. A subsidence of $\frac{5}{100}$ was very speedily followed by the same consequences, as on the 14th and 15th August 1832. This result forms a striking contrast with observations made between the tropics, where we find, in similar circumstances, a more decided fall of the mercury, seldom less than $\frac{1}{10}$ previous to the occurrence of rain, which is about double the subsidence as obtained by this register.

3. When frost occurred, the barometer generally rose from $\frac{5}{100}$ to half an inch. Snow most commonly depressed the mercurial column, while a thaw elevated it.

4. The mean height of the barometer for the two years 1832 and 1833 is, after correction for temperature, $(29.523 + 29.257) \div 2 = 29.390$; from which we may calculate the elevation of Eccles above the level of the sea.

By the formula $45 (\theta - \frac{1}{\theta})$, applied to the diminution of temperature by the rarefaction of air, reckoning the density of the air in the same latitude at the sea 1, and assuming 29.82 as the standard barometer pressure for Britain, we have $29.82 : 29.39 :: 1 : .985 =$ density of air at Eccles. Then $1 \div .985 = 1.015$. By substitution the formula becomes $45 (1.015 - .985) = 45 \times .030 = 1.35 =$ difference of temperature between the two stations.

Assume the law of equable progression, $1 : 270 :: 1.35 : 364\frac{1}{2} =$ feet above the level of the sea, shewing a gentle ascent of $315\frac{1}{2}$ feet to Stitchell, which is about five miles distant, and 680 feet above the sea, according to Mr Blackadder, and $533\frac{1}{2}$ to Hume Castle, which, by the same authority, has an elevation of 898 feet.

We arrive at the mean temperature, by comparing the mean temperatures of stations well established. The mean temperature of Glasgow, which is situated in $55^{\circ} 31' 32''$ north latitude, is $47^{\circ} 75'$, and that of London 50° , St Pauls being situated in $51^{\circ} 30' 49''$ north latitude; from which it appears that the temperature of the atmosphere diminishes 0.53 Fahrenheit, for every additional degree of latitude. Eccles is situated in about $75^{\circ} 40'$ north latitude, or $11\frac{1}{2}$ miles south of Glasgow, with a difference of $+ \frac{1}{10}$ temperature. Hence we have for Eccles a mean temperature of $47^{\circ} 85'$. By deducting the difference of temperature of the two stations, as obtained by the formula, from the standard temperature $48^{\circ} 66' - 1^{\circ}.35 = 47^{\circ} 31' =$ the mean temperature, which is, however, probably less than the true number by a considerable sum.

*List of Plants discovered within the District, since the publication of
DR JOHNSTON'S Flora of Berwick-upon-Tweed.*

a. DICOTYLEDONES.

CHRYOSPLENium ALTERNIFOLIUM—*Alternate-leaved Golden Saxifrage.*

Langton woods: at Longformacus: near Cockburn mill, Mr Thomas Brown. Dunglass Dean, intermixed with the *C. oppositifolium*, from which it differs in growing in a more scattered manner, seldom above ten or twelve specimens together; in preferring a more shady and less damp spot, seldom growing where the water stands; and in having both leaves and flowers of a larger size and bright colour; Mr R. Embleton.

SAXIFRAGA HYPNOIDES—*Mossy Saxifrage.* Dunsdale and Henhole Hopes, parts of the Cheviots; Miss Hunter, and Miss E. Bell.

SAXIFRAGA HIRCULUS—Near Langton wood, Berwickshire; Mr Thomas Brown.

PEPLIS PORTULA—*Water Purslane.* In a ditch on the Tower farm near Cockburnspath, plentiful; Rev. A. Baird. Near the head of Lemington Dean; Mr Carr.

LOTUS DECUMBENS—*Spreading Bird's-Foot Trefoil.* Cultivated fields between Coldingham Lough and the sea; Dr Johnston and Mr Embleton.

LATHYRUS SYLVESTRIS—*Narrow-leaved Everlasting Pea.* Banks of the Whiteadder, opposite Hutton mill, in great abundance; Mr R. Dunlop.

SPIRÆA FILIPENDULA—*Common Dropwort.* Belches Braes near the Lees; Miss E. Bell and Mr Embleton. Perhaps not indigenous there.

SISON AMOMUM—*Bastard Stone-Parsley.* Sides of the Hirsell Lough, plentiful; Misses Bell and Miss Hunter.

BIDENS TRIPARTITA—*Three-lobed Bur Marigold.* By the side of a ditch near the Brewery in the village of Chatton, Northumberland; Mr Mitchell.

HIERACIUM MOLLE—*Soft-leaved Hawkweed.* Langton woods; Mr Brown.

HIERACIUM PRENANTHOIDES—*Rough-bordered Hawkweed.* Wooded bank opposite Bank-house, Berwickshire; Mr W. Baird.

LITHOSPERMUM MARITIMUM—*Sea Gromwell.* On the shore at the mouth of the Pease-burn; Rev. J. Baird. Lumsden shore, plentiful; Mr Carr.

MYOSOTIS SYLVATICA—*Wood Scorpion-grass.* Langton woods. "*M. sylvatica* is now (May 25.) adorning with its large lovely blossoms

the banks of Langton woods. It is, I am persuaded, a good species, though it may be difficult to give technical marks. No one who has seen it, will deny its claims, or unite it with *M. arvensis*." Mr Brown.

SCROPHULARIA AQUATICA—*Water Figwort*. On the sides of the Whiteadder below Claribad mill, plentiful; Mr R. Dunlop.

MENTHA SYLVESTRIS—*Horse Mint*. In the neighbourhood of Blanerne, abundant; Mr Dunlop.

MENTHA CRISPA, Linn.—Side of Wooler Water near Coldgate mill; and about one mile and a half above Langleyford, on the borders of a rivulet flowing down from the Cheviot, and near its junction with the Wooler Water; Mr Mitchell. A specimen of this addition to the British Flora being sent to Mr Winch, he pronounced it to be the *M. crispa* of Linnaeus, an opinion which has been since confirmed, and it is understood that a figure of it will soon appear in the Supplement to English Botany. The following extract is from a letter of Mr Mitchell: "I took the mint to Mr Bennet, who has the charge of the Linnean herbarium. On comparing it with Linnaeus' specimens it is *M. crispa*, as you mentioned: there seems to be no natural habitat for it except in Northumberland, for though Linnaeus gives Siberia, Switzerland, and Hartz in Germany, the first of these, by a pencil note of Sir J. E. Smith, appears to have been founded on a very different plant. The Swiss habitat adopted from Haller is taken from specimens stated by the author himself to be exotic: and the plant of the Hartz, first noticed by Weber in 1774, appears, from the reference by Hoffman of Ehrhart's plant to the same locality, to have been the *M. crispata*."

STACHYS AMBIGUA—*Ambiguous Woundwort*. In Edmonston Dean, Berwickshire, among whins, sparingly; Dr Johnston.

CHENOPodium URBICUM—*Upright Goose-foot*. Hirsell Woods; Mr Embleton.

SALIX ARGENTEA—*Silvery Willow*. In the bog on Birgham Muir; Dr Johnston. In a bog to the north of Sweet-hope farm house; Mr Brown.

b. MONOCOTYLEDONES.

SPARGANIUM NATANS—*Floating Bur-reed*. In the foss at the top of Coldingham Lough, abundant; Dr Johnston. Northfield Mill-pond; Mr Dunlop.

SERAPIAS LATIFOLIA—*Broad-leaved Helleborine*. Woods at the Hirsell and Castle-law; Misses Bell.

CAREX DISTANS—*Loose Carex*. Mouth of the Whiteadder; Mr R. Dunlop.

- CAREX FULVA—*Tawny Carex*. Near Legerwood, Mr T. Brown. Bogs about Buncle; and plentiful in the bog below Lintlaw; Mr R. Dunlop.
- CAREX VESICARIA—*Bladder Carex*. In boggy ground above Wooler Water, opposite the Shepherd's house near Middleton Hall; Mr Mitchell.
- CAREX EDERI—*Ælerian Carex*. In a bog near Mayfield, abundantly; Mr Dunlop.
- BROMUS RACEMOSUS—*Smooth Brome-grass*. In fields near Coldstream and Anton's Hill; Miss Bell.

c. CRYPTOGRAMOUS.

- ASPIDIUM THELYPTERIS—*Marsh Shield-fern*. Learmouth bogs, Northumberland; Mr R. Embleton.
- OSMUNDA REGALIS—*Common Osmund-royal*. Routing Linn near Fenton, Northumberland; Mr Mitchell.
- PHASCUM AXILLARE. Wettish Dean a little to the south-east of Ræcleugh Head; Mr Brown.
- GYMNOSTOMUM FASCICULARE. Langton Lee's Cleugh; Mr Brown.
- ORTHOTRICHUM DIAPHANUM. On the wall of Langton Wood; Mr Brown.
- BRYUM MARGINATUM. Langton Lee's Cleugh; Mr Brown.
- HYPNUM STRAMINEUM. Choose Lee, in the parish of Langton, in fine fruit; Mr Brown.
- HYPNUM PILIFERUM. Langton Lee's Cleugh; Mr Brown.
- HYPNUM MURALE. Langton Wood; Mr Brown.
- HYPNUM CORDIFOLIUM. Langton Woods; Mr Brown. In the bog on Birgham Muir; Dr Johnston.
- MARCHANTIA CONICA. Dunglass Dean, plentiful; Rev. J. Baird. Langton Lees; Mr Brown.
- JUNGERMANNIA CILIARIS. Buncle Wood; Muir near Langton Lees, plentiful about Stichel House; Mr Brown.
- JUNGERMANNIA CRENULATA. Langton Lee's Cleugh, and at Legerwood; Mr Brown. Dunglass Dean; Mr Embleton.
- JUNGERMANNIA REPTANS. Langton Lee's Cleugh; Mr Brown.
- JUNGERMANNIA RESUPINATA. Lammermuir's near Westruther; Roadside near Nesbit; Mr Brown.
- JUNGERMANNIA TOMENTELLA. Langton Lee's Cleugh; Mr Brown.
- JUNGERMANNIA SERPYLLIFOLIA. Sides of a little stream that falls into the Whiteadder above half a mile west of Abbey St Bathans; Mr Brown.
- COLLEMA NIGRESCENS. Langton Woods; Mr Brown.
- GYROPHORA POLYPHYLLA. Abbey St Bathans; Mr Brown.
- PARMELIA CAPERATA. Hairy-heugh Crag, Berwickshire; Mr Brown.

- CALICIUM SPILEROCEPHALUM.** On the barks of trees about Stichel House; Mr Brown.
- STICTA FULIGINOSA.** Langton Lee's Cleugh; Mr Brown.
- CHROOLEPUS EBENEUS.** On shelving rocks in Edmonston Dean, Berwickshire; Dr Johnston.
- SPHACELARIA CIRRHOSA.** On the shore a little north of St Abb's Head; Dr Johnston.
- DASYA COCCINEA.** Berwick Bay, occasionally cast on shore in abundance; Dr Johnston. Near Embleton; Mr Embleton.
- ULVA DEFRACTA, Withering.** Coldingham shore, after a storm; Rev. Mr Campbell. It is in some respects an interesting sea-weed,—mostly so in this; that no one seems yet to have detected a specimen with the slightest appearance of a root. Mr C.'s specimens were equally imperfect. The plant was first discovered on the beach at Weymouth, by Major Velley, and described by him in Withering's Arrangement of British Plants. It was afterwards found by Mr Brodie of Brodie, on the coast of Fife, who supplied the specimens figured in English Botany; and subsequently Messrs Borrer and Hooker gathered it on the shores of the Orkney Islands;—so that, if a rare species, it has at least an extensive geographical range. Dr Hooker says it is very unlike any other ulva, “and has rather the appearance of animal matter,” but the opinion here hazarded has no foundation. It is a true vegetable, as I am perfectly satisfied by a careful examination of it, possessing in fact the character of the genus *Dumontia* of Greville, who, however, takes no notice of this species in his *Algæ Britannicæ*: Dr Johnston.
- PALMELLA HYALINA.** In the Hirsell Lough, plentiful, swimming on the surface in green gelatinous, globular, more or less lobulated masses, from the size of a pea to that of a walnut; Dr Johnston.
- NOSTOC VERRUCOSUM.** In a small rivulet running into the Whiteadder near Ord-wheel; Mr Brown.
- HYDNUM MEMBRANACETUM, Bot. Gall.** On a decaying trunk of some tree in New-water-haugh wood; Dr Johnston. About Eccles, common; Dr Thomson.
- PEZIZA MACROPUS.** Langton Lee's Cleugh; Mr Brown. This fungus, when recently dried, exhales the peculiar disagreeable smell of mice in a remarkable degree.
- PEZIZA COCCINEA, Bot. Gall. ii. 740.** On the ground in damp places in the woods about the Hirsell.
- PEZIZA UMBRINA, Grev. Fl. Edin. 419.** On the ground in the Hirsell fir plantations.
- PEZIZA PUNCTIFORMIS, Grev.** On decayed trees in Hirsell plantations.

Address to the Berwickshire Naturalists' Club, read at its Third Anniversary Meeting, September 17, 1834. By P. J. SELBY, Esq. President.

GENTLEMEN,

HAVING now to resign this chair, and the honourable station in which I was placed at the last anniversary meeting of the Club, by your kind but unmerited partiality, I shall proceed, in imitation of the example recommended by the first promoter of the Society, and so ably illustrated by himself and his successor in their respective addresses, to give a rapid, though I fear it will prove a very imperfect sketch of the proceedings at our different meetings, and the result of the labours and researches of the various members of the Club during the past year. Before I enter more immediately into this detail, I may be permitted to congratulate the Club upon its present prosperity, and the probability—I had almost said certainty—of its increasing usefulness in furthering and accomplishing those objects which first led to its institution. It has been increased, since the last anniversary, by the acquisition of several members,* all of whom, I hope, have entered the Society prepared and fully determined to contribute each his mite to the general stock of information. This progressive increase of members augurs well for the stability and future success of the Club;—and shows that the motives which first led to its formation begin to have their proper weight, and to be duly appreciated, and that the advancement of science, and consequent increase of knowledge, is considered likely to be benefited by the existence of such societies as our own. The first meeting to which I call your attention, is that of the anniversary, held at Dunse in September 1833. Of the excursion of the day, I can give but an imperfect account, having been unable to attend it in person; but from the minutes of the meeting, I can gather, that it was not devoid of interest: for although the season of the year precluded the hope of meeting with any great variety of Flora's gifts, several samples of that rare plant, the *Saxifraga Hirculus*, were procured; and as the woods and plantations, which embellish the vicinity of the town, and the castellated mansion of Mr Hay, were selected for the walk of the day, many interesting mosses, lichens, and other cryptogamic plants, were observed in their secluded and umbrageous recesses. To the excellent address of the President, delivered

* Rev. Mr Wallace, of Abbey St Bathans	-	-	-	-	April 16. 1834.
George Darling, Esq. Weetwood	-	-	-	-	June 18. ...
Mr William Carr, Ford	-	-	-	-	..... ...
Rev. Mr Turnbull of Eyemouth	-	-	-	-	July 30. ...
Mr Francis Douglas, Kelso	-	-	-	-	..... ...
Captain Mitford, R.N.	-	-	-	-	Sept. 17. ...
Rev. J. Parker, Curate of Chatton	-	-	-	-	..... ...

upon that occasion, I need scarcely recall the attention of those who had the satisfaction of hearing it in person ; and I am sure, those who did not enjoy that pleasure will rejoice with me, that the subsequent publication of our Transactions has now placed it within their reach. Among the communications read at the meeting, the first related to a bird belonging to the genus *Cataractes* (Skua), killed upon the adjoining coast, and which, at that time, I could not precisely refer to any of the described species, although I pointed out its near affinity to the *Cataractes* (*Lestris Richardsonii*) of the Fauna Bor. Amer. I have since ascertained, that it is identical with that kind, the under plumage being subject to vary, and not always possessing the uniform brown tint, as described in that work ; and further, that it is this species which annually resorts to the northern islands of Scotland, for the purpose of incubation, and not the true *Cat. parasiticus* (Arctic Skua), as ornithologists have hitherto generally supposed. Dr Johnston afterwards read an interesting paper, on the Insects, Mollusca, &c., observed at the previous meeting held at Holy Island, enriched with valuable and curious remarks on their structure and functions. Among the insects I may particularise the *Phyllopertha Frischii*, a beetle of rare occurrence in the north, and very locally distributed, and which has only once been met with beyond the northern boundary of the Tweed. Next followed a paper by our worthy secretary, Mr Embleton, on the plants observed at the former meeting, and a continuation of his interesting meteorological observations. Mr Mitchell also read an account of the brown amethyst found in a ravine near Cheviot, amongst the debris of the porphyritic trap-rock, exhibiting a specimen of the gem, and a list of new habitats for rare plants. This was succeeded by an ingenious paper of Dr Thomson's on the *Tormentilla reptans*, and the genus *Potamogeton* ; and the business of the meeting was concluded by a curious account of the game of *Ball*, as played at Dunse on Fastern's Eve, by Mr Thomas Brown.

As usual, the next meeting was held in December at Berwick-upon-Tweed, where, in defiance of the short days and wintry blasts, a numerous party assembled. The wetness of the morning prevented any extended excursion ; but towards noon, when the mists and rain cleared off, a ramble along the steep and rocky coast to the north of the town, as far as the lofty pinnacle-shaped rock, called the Needle Eye, from the perforation at its base, delighted those who had not before visited the environs of Berwick ; and the interest of the walk was increased by a search along the shore for algæ and other marine productions. At this meeting I may mention, that the Club resolved to print the communications already read before it, a resolution I hold to be of great importance, and which, I hope, will be repeated at regular intervals, not only on account of the intrinsic value the papers may individually possess, and which are thus made available to others ; but, as an evidence that the Club is really earnest in its inten-

tions and pursuits, and that the advancement of science and knowledge, however limited in degree, is the principal object, and the ultimate aim, of our association. At this meeting we were favoured with communications, connected with zoology, botany, and meteorology. In the first department, Dr Johnston gave excellent descriptions of two species of the genus *Delphinus*, viz., the *Delphinus phocaena* (common Porpoise,), and the *Delphinus melas* or *deductor* (Ca'ing whale). His account, which embraced the anatomy and peculiarities of structure observable in these marine animals, was further illustrated by beautiful figures and drawings from the pencil of his amiable lady. The occurrence of the *Phalaropus lobatus*, a rare British bird, was also mentioned as having been killed within the precincts of our district; and a rare moth,* from the wooded glen of the *Pease Burn*. A list of localities of rare plants was furnished by our accomplished coadjutrix Miss Bell; and a second list of the same nature was also read by Dr Thomson, who added three species of fungi to the cryptogamic catalogue of the district. The same gentleman favoured the Club with an analysis of a ball of iron-pyrites found near Eyemouth. The business of this meeting was concluded by a paper from the pen of Mr William Baird, who delighted the assembled members by his admirable and poetic description of the Aurora Borealis, as it had appeared on various evenings during the late autumnal and winter months. Upon one occasion he adverts to a noise he heard during the brightest corruscations of the meteor, resembling, as he describes it, the gushing of a sudden breeze among trees, or the noise produced by the quick flight of a bird overhead. This peculiar sound, he adds, was heard the same evening by other observers in the neighbourhood; but whether it actually originated with, and was caused by the aurora, or proceeded from some other extraneous source (though nothing occurred at the time to account otherwise for its production), he ventures not to decide, knowing that a discrepancy of opinion exists upon this point, which can only be set at rest by repeated and long-continued observation of the phenomena. I need scarcely recall to the recollection of those who attended the Spring Meeting, the pleasant and instructive day we passed at Abbey St. Bathans, so sweetly situated upon the secluded and quiet banks of the silvery Whitadder, where, while some amused themselves, with dexterous art and well-trimmed flies, in deceiving the finny tenants of that limpid stream, others resorted to the woods and fields in search of Flora's treasures, or those insect tribes which, recalled to life and activity by the revivifying influence of the season, had already quitted their hybernacular retreats. Several specimens of a trout were taken, in form and character analogous to the *Orange fin* of the Tweed, which there is every reason to believe is the fry of the *Salmo Trutta* of authors, the common sea-trout of most of our northern

* *Hipparchus Papilionarius*, taken by Mr William Dunlop.

rivers. I may also mention that, in passing through the woods of the "Retreat," several ring-ouzels (*Merula torquata*) were observed. These had apparently just arrived from more southern climes, and were then wending their way to those upland rocks and craggy dells, their appropriate summer retreats, there to be engaged in those momentous offices connected with the reproduction of their species. The wheat-ear (*Saxicola Œnanthe*), another of our summer visitants, and one of the first harbingers of spring, was also seen flitting across the moory waste, catching the attention of the ornithologist, as it flew from stone to stone, by the conspicuous display of its snow-white rump. The communications made to this meeting were 1st, A paper by Sir William Jardine, on the hirling of the Solway, with some observations on its habits and distribution; and further shewing that this fish appears to be identical with the silver-white of the river Tweed. By most ichthyologists it has been considered a good species; in which opinion I am still inclined to concur, although, upon a late occasion it was deemed by Monsieur Agassiz, an authority of great and acknowledged weight, to be a variety only of the *Salmo Trutta* of Linn. Further observations, therefore, upon its structure and habits, must be carefully instituted, in order either to establish its claim, by characters of sufficient importance, to a specific distinction, or, if found wanting in them, to erase at once its name from the station it has hitherto held in our systematic arrangements. The same gentleman mentioned the fact of the alpine swift (*Cypselus alpinus*) having again been killed in Ireland, and the occurrence of the *Larus Sabini* in the same country. He also adverted to the curious variety of the hare found in that country, possessing a fur of a different quality and colour from that of the common kind, and more analogous to that of the alpine hare (*Lepus variabilis*, Flem.) When first noticed, it was supposed to be a distinct and undescribed species; but farther observation leads to the conclusion, that it is only a marked variety of the *Lepus timidus*,—intermediate stages, as it were, having been found, which connect the extreme variety with the common type. Mr Henderson afterwards gave a portion of a meteorological register, which he was requested to continue; and after the exhibition of a rare species of star-fish, the *Ophiura granulata*, new to the Berwickshire district, by Dr Johnston, the meeting was concluded by an interesting notice from the same gentleman, of some Roman funereal urns, recently dug up at Murton, near Berwick.

The first Summer Meeting in June, was held at Millfield, in the richly cultivated vale of Till, but being at that time absent upon an excursion to the wilds of Sutherland, I can only speak of the occurrences of the day, from the minutes of the Club. From these it appears, that the anticipation of a delightful and productive walk, to the hill of Yeavering-Bell, was, unfortunately, in a great measure disappointed, towards noon, by a heavy and continued rain, which

compelled the party, however reluctant, to seek the shelter of the village inn, but not before that rare and lovely plant, the *Pyrola secunda*, had been culled by Dr Johnston and Rev. Mr J. Baird. Communications from both these gentlemen were afterwards read; that of Mr Baird referred to a plant found near to Kirk-Yetholm, and which he endeavoured to prove was the *Anemone ranunculoides* and not the *Ranunculus auricomus*, as had been suggested by Professor Graham. It, however, appears, that doubts still remain upon this point, which we may hope to have resolved, by the reappearance of the flower in the same locality where it was first discovered by Mr Baird last spring, who has undertaken to watch narrowly its progress the ensuing season. Dr Johnston's paper contained a notice of the plants and insects observed at Abbey St Bathans in April last. Among the former, he particularizes the *Populus tremula*, which grew, evidently in a wild state, upon a bank of natural brushwood, nearly opposite the little inn, and the *Morchella esculenta* (Morel), a rare fungus in this district, but which was that day gathered in considerable abundance in the woods around the "Retreat." He also added to his former list of Berwickshire fishes four new species, among which we notice the *Blennius tentacularis*,* a fish new to the Scottish Fauna, and of rare occurrence upon the English coast. Mr Armstrong mentioned to the Club the fact of the ring-ouzel breeding upon the hills in the neighbourhood of Wooler, from whence he had procured the nest; and that a hooded crow (*Corvus cornix*), had this last spring paired with a carrion crow (*Corvus corone*) at Fowberry, where it was killed from the nest, containing eggs. Examples of a similar nature have also been known to occur in Dumfriesshire, by our colleague, Sir W. Jardine; and Temminck remarks that, in the northern counties of Europe, where the *C. corone* is rare, a mixed breed is sometimes produced between it and the *C. cornix*. I cannot, however, entertain a doubt as to the specific difference of the two birds, although Dr Fleming, I believe, hesitates in considering them distinct; the marked and constant difference of plumage, the form and size of their bills, their different cries, easily distinguished by the accurate observer, and the dissimilarity of habits and manners, evidently separate them too far to warrant us in considering them as mere varieties of the same species. This is indeed further strengthened by the rarity of such associations, and the circumstances under which they always take place, viz., when one of the species is rare and thinly disseminated, as in those parts quoted by Temminck, or in our own country, where some accident has detained the *C. cornix*, and prevented it re-migrating at the usual period with its congeners. Circumstances again unfortunately prevented my presence at the July meeting of the Club at Smailholm, where a lovely

* Of Brunnich. Cuv. Reg. Anim. ii. 237. The *Crested Blenny* of Pennant.—Mr Yarrell, to whom the specimen was presented.

day and an interesting excursion, in a district rendered classical by the magic pen of Sir Walter Scott, appears to have given unalloyed satisfaction to the assembled members of the Club, and to their visitors from the Tweedside Physical and Antiquarian Society. The principal object of the excursion was the examination of *Whiterig Bog*, remarkable for its extensive deposit of shell-marl, used by the agriculturists of the district as a manure, or alkaline corrective. The Peel or Tower of Smailholm, one of the Border defences in earlier times, was afterwards visited, and the botanical treasures of the morass, at the foot of the rocky steep upon which it is perched, where several interesting plants, such as the cranberry (*Vaccinium Oxycoccus*), sundew (*Drosera rotundifolia*), &c., were gathered. Several additions to the Berwickshire Flora were announced, as the discoveries of our colleagues, Miss Hunter and Miss Bell, whose exertions and success in enriching the Flora of the district have before been adverted to. A pleasing and graphic account of the excursion of the Club in June was afterwards read by Dr Johnston, and the business of this meeting was concluded by some remarks upon a deposit of marl by Mr Mitchell, which he further illustrated by specimens of the shells composing it.

Such, gentlemen, is a rapid, but inadequate recapitulation of the labours and proceedings of the Club during the third year of its existence, but from which, however imperfect it may be, we can gather that much important information upon various subjects connected with the objects we have in view has been brought before it, and that many interesting additions in the various departments of natural history have rewarded the zeal of our colleagues, and enriched the catalogue of our local Fauna. It may perhaps be objected that the excursions of the last year have not been so productive as those of the two former; but, even allowing it were so, can we feel disappointed or even surprised that such should be the case, when we consider the limited district to which we are confined, and that the greater part of the ground has already been trodden by the Club? Besides, it is by a closer and more minute investigation than we can afford to bestow, during our appointed walks, that the zeal of the entomologist, the botanist, or the cultivator of any other department of natural history, can expect to be fully rewarded. But even should our walks afford nothing new, or that we had not previously met with, still I hold that one great object of our meeting remains in full force, and its utility is but slightly, if at all, restricted, for it is the associating together in friendly communion of individuals engaged in similar scientific pursuits who otherwise have but few opportunities of intercourse; it is in the interchange of opinion and sentiment thus personally enjoyed, and to those friendly discussions tending to elucidate truth, or correct erroneous views, that, in my humble opinion, the expediency, as well as the chief utility, of such associations as our own are to be estimated. Let it not, however, be supposed that I imagine

the field of discovery in the district we embrace, or even in the very limited portion of it to which our walk this day has been restricted, is either exhausted or destitute of objects to reward the patient and zealous disciple of nature. On the contrary, I feel confident that the mine is still rich and productive, and that our provincial fauna may yet, through our exertions, be greatly extended. Witness, I may almost say, the daily discovery of species, many of them new, others which have not hitherto been observed within the limit of our district, by our highly-gifted and respected associate, whose labours are at present especially directed to those curious and interesting beings belonging to the invertebrate class, and whose acute and microscopic eye aided by the pencil of his amiable consort, has made us familiar with the wonderful structure of many of those extraordinary creatures. Witness, I may add, the specimens of the rare and elegant insect exhibited this very day, and captured within view of the apartment in which we are now assembled.

But should our research unexpectedly, and contrary to what I really think can possibly happen, prove unrewarded by the discovery of any thing new, or even rare, let not our ardour be depressed, or a feeling of disappointment turn us aside from the contemplation of Nature's lovely works ; for, though I admit the acquisition of a new or unexpected object is accompanied with a feeling of a pleasant and gratifying description, and is calculated to foster and increase our zeal, still another, and in many cases an unexplored field, lies open to all interested in these pursuits, sufficient of itself to occupy our attention, and reward the utmost labour we can bestow upon it,—I mean the physiology and structure of what we already possess, or can at all times easily acquire ; a study the most delightful, and at the same time the most instructive ; a study which, in well-regulated minds, cannot fail, by the wonders it discloses of consummate wisdom, admirable contrivance, and beautiful adaptation, to improve and raise the mind to that omnipotent and beneficent Being, the author of the universe and all that it contains, and to call forth those feelings of adoration, and gratitude, and love, the legitimate and only proper objects of all our learning and scientific acquirements ; and which may teach us to exclaim with the sacred poet of old, “ He spake the word, and they were made ; He commanded, and they stood fast.”

P. J. S.

Notice of the Capture of Deilephila Galii (Scarce Spot Elephant Moth) a rare Lepidopterous Insect, belonging to the Family of the Sphingidæ, Leach. By P. J. SELBY, Esq. of Twizell House.

On the evening of the 12th of August 1834, soon after sunset, when looking after *Phalænæ* in the garden at Twizell House, my attention was attracted by a large moth hovering, in the manner of the *Humming-bird Sphinx* (*Macroglossa stellatarum*), in front of the flowers of a *Monarda*, and probing their tubes with its long extensile proboscis; waiting an opportunity, I succeeded in securing it, when it proved to be a beautiful and newly excluded specimen of the *Deilephila Galii* Steph., one of our rarest British insects. A second was taken in the same garden the evening of the 14th August; and I have since learnt that another, now in the possession of Dr Johnston, was secured about the same time in the neighbourhood of Berwick. This is the first authenticated instance of the occurrence of this beautiful sphinx in the north of England, and in the south four or five examples only of its capture are recorded.

Notice of the Brown Amethyst. By JAMES MITCHELL, Esq. R.N.

I HAVE found that rare and beautiful gem the brown amethyst, in a ravine near Cheviot, Northumberland, called by the people around the Diamond Quarry, from the numerous specimens of rock-crystal, and other specimens of crystallized quartz, found there. A specimen of the brown amethyst, cut and set, I now submit to the inspection of the Society. Previously to my finding this mineral, it was not known to exist in Northumberland, for the locality is not mentioned by Professor Jameson in his splendid and hitherto unrivalled work on mineralogy. This ravine, which is formed by the washing away and consequent decay of the porphyry rocks by a small river, exhibits blocks of various sizes of quartz-rocks amongst the clay of its banks. Many of them on being broken discover drusy cavities, the walls of which are filled with most beautiful crystals of quartz of various colours, tinged by iron, some yellow, others blue, and some jet black, while others are the fine rock-crystal, having no colouring matter. Some of the crystals I have found covered with a red ochry crust of iron-ore, which could not be scraped off by the knife. The brown amethyst I discovered in single perfect crystals amongst the yellow detritus of the decayed porphyry; and I have no doubt that they had come from some drusy cavity in the quartz-rocks.

Remarks on a Deposit of Shell-Marl. By Mr JAMES MITCHELL, Surgeon,
Royal Navy.

ABOUT a mile and a half from Wooler, Northumberland, on the estate of Colonel Hughes, called Middleton Hall, there is a very extensive deposit of shell-marl, about three or four acres in length, and one in breadth. The Colonel remembers it as a lake, with its margin and banks adorned with trees and shrubs; it seems to have been fed by numerous springs, some of which exist even in the present day; but it has been so well drained that now it may be crossed anywhere in safety, and is indeed so dry as annually to yield a fine crop of natural hay. Only a very small part of this agricultural treasure has been dug into, no more being taken out than suffices for the use of the estate, and it has produced very luxuriant crops. Yet, small as is the part which has been opened, there is sufficient to interest the observer of nature. Previous to its being drained, the peat was so spongy as to measure about four feet deep; it is now reduced to between two and three. In this peat, which covers the marl, were found oak and willow trees, with acorns, hazel-nuts, &c.; but no remains of animals have yet occurred in it. The marl, so far as they have yet dug, is, in the best places, about ten feet, but it varies in thickness, and it is very likely that it will be thicker in the centre. It is white, with rather a yellow tint. In its upper strata the shells are very perfect, but below, from the greater pressure, they are broken or comminuted, and in general obliterated. They are the same species which are found in fresh-water ponds at the present day; and, through the kindness of Mr Nichol of Edinburgh I am enabled to give their names, viz., *Cyclas cornea*, *C. pusilla*, *Succinea amphibia*, *Planorbis contortus*, *Pl. fontanus*, *Limneus pereger*, *Valvata obtusa*, and *V. spirorbis*. There were found also in the marl two complete skeletons of the red deer (*Cervus elephas*), with very large branching antlers. They were standing in an upright position, which seems to corroborate the statement of Mr Lyell, who says—"Deer, and such species as take readily to the water, may often have been mired in trying to land where the bottom was soft and quaggy, and, in their efforts to escape, may have plunged deeper into the marly bottom. Some individuals, we suspect, of different species, have fallen in when crossing the frozen surface in winter, for nothing can be more treacherous than the ice when covered with snow, in consequence of the springs which are numerous, and which, always retaining an equal temperature, cause the ice, in certain spots, to be extremely thin, while, in every other part of the lake, it is strong enough to bear the heaviest weights."—*Prin. of Geol.* vol. ii. p. 251.

Facts relating to the Tormentilla officinalis. By Dr R. D. THOMSON.

THE following tables have been drawn up from observations on the *Tormentilla officinalis*, which were made with the view of contributing to the determination of a question which has interested most botanists—whether the genus *Tormentilla* should be considered as distinct from *Potentilla*, or whether the species of the former genus should be ranked under the latter. I have seen observations somewhat similar, but upon a less particular plan, than those I have detailed, for nothing has hitherto been related regarding the soils upon which the different specimens examined had vegetated, which must be considered of very considerable importance in determining the effect of soil in increasing or diminishing the number of petals. The plants subjected to examination were collected on four distinct formations, viz., 1. Mica-slate, 2. Old Red Sandstone, 3. New Red Sandstone, and 4. Diluvium. By the latter term is to be understood the gravel left by the retiring of Loch Lomond, on the west side of that lake, on the road from Helensburgh to Luss, which passes through numerous artificial-looking tumuli, presenting a rounded outline. A careful search satisfied me that these were formerly islands in the lake, similar to those which now vary so beautifully its surface, and which have been left as isolated hillocks by the gradual draining of the lake. The gravel consists of clay-slate. The new red sandstone at Helensburgh is formed of fragments of clay-slate, imbedded in clay, obviously a product of the disintegration of the clay-slate rocks, and is overlaid in general by a stiff reddish soil. The new red sandstone of Berwickshire appears to be closely connected with the carboniferous series. These observations seem necessary in order that the subsequent facts may be better appreciated.

		Numbers	Petals.	Sepals.			Numbers	Petals.	Sepals.						
Mica Slate formation, Head of Loch Goyle, Argyshire.	100	99 1	4 5	8 8	5th Petal imperfect. 4th Petal deeply cleft. 6th Petal imperfect.	New Red Sandstone of Helensburgh Moor, Dumbarton-shire—(Continued).	300	91 5 2 1 1	4 5 5 5 5	8 10 8 9 11	Dyke in a cultivated field. 5th Petal very minute.				
	200	98 1 1	4 6 6	8 8 9			400	93 5 1 1	4 5 5 6	8 10 11 14					
	300	99 1	4 5	8 10			500	97 2 1	4 5 5	8 10 11					
	400	100	4	8			600	98 1 1 1	4 6 5 6	8 11 10 10					
	500	97 3	4 5	8 10			700	98 2	4 5	8 10					
	600	97 1 1 1	4 5 5 6	8 9 11 11			800	99 1	4 5	8 10					
	700	100	4	8			900	94 2 2 1 1	4 5 5 5 5	8 10 9 11 12					
	800	99 1	4 5	8 9			1000	98 2	4 5	8 10					
	900	98 1 1	4 5 5	8 9 10			Summary, ...	964 22 4 4 2 1 1 1	4 5 5 5 5 6 6 8	8 10 11 9 8 12 11 14					
	1000	98 1 1 1 1 1	4 6 6 6 5 5	8 9 12 11 8 11 8			Summary, ...	964 22 4 4 2 1 1 1	4 5 5 5 5 6 6 8	8 10 11 9 8 12 11 14					
	Summary,	...	985 5 3 2 1 1 1 1 1	4 5 5 6 6 6 6 5 5			8 10 9 9 12 11 8 11 8	6th imperfect.	Diluvial Soil near Luss, Loch Lomond.	100		98 2 1	4 5 6	8 10 10	
	Old Red Sandstone, var. of Greywacke, Greenlaw Moor. DUMFRIES.	100	98 2	4 5			8 10			200		99 1	4 6	8 12	
		200	99 1	4 5			8 10			300		98 2	4 5	8 10	
		300	99 1	4 5			8 10			400		99 2	4 5	8 10	
400		98 2	4 5	8 10	500	100	4			8					
500		100	4	8	Summary, ...	690 6 1 1 1 1	4 5 5 6 6 7			8 10 8 10 12 11					
New Red Sandstone, Birgham, Moor. BREWICK.	600	99	4	8	{ 2 Petals divided.	Summary,	700	99	4	8					
	700	99	4	8			800	99	4	8					
	800	99	4	8			900	99	4	8					
	900	99	4	8			1000	99	4	8					
	1000	99	4	8			Summary, ...	989 10 1	4 5 6	8 10 12					
Summary,	1000	989 10 1	4 5 6	8 10 12			700	98 1 1 1 1	4 5 6 6 7	8 10 12 12 11					
New Red Sandstone, Helensburgh Moor, Dumbarton-shire.	100	98 1 1	4 8 5	8 9 10			Summary, ...	690 6 1 1 1 1	4 5 5 6 6 7	8 10 8 10 12 11					
	200	98 1 1	4 5 5	8 10 9			700	98 1 1 1 1	4 5 6 6 7	8 10 12 12 11					
	300	99 1	4 5	8 10			800	99 1	4 5	8 10					
	400	99 1	4 5	8 10			900	99 1	4 5	8 10					
	500	99 1	4 5	8 10			1000	99 1	4 5	8 10					

It appears, therefore, that of 3700 specimens of flowers, 3628 have all the characters of *Tormentilla* ; 43 possess those of *Potentilla*, while the remaining 29 vary in the number and proportion of the divisions of the calyx and corolla. The conclusion to which these facts inclines is, that the genus *Tormentilla* does exist, and that the occasional multiplicity of petals and sepals is to be referred to luxuriance of growth.

August, 1834.

The Game of Ball as played in Dunse on Fastern's Eve. By Mr
THOMAS BROWN.

As one object of this Club is to examine the antiquities of Berwickshire, a brief notice of the above game may not be unacceptable. Though still kept up, the interest taken in it has greatly decreased, and it may, not improbably, disappear ere long. It is not so much, therefore, from its present state that a complete description is to be drawn, as from the recollections of the oldest inhabitants. I have only to regret that the details here presented are not more complete.

Fastern's Eve, or, as it is here called, Fastern's E'en, was once almost, if not altogether, a holiday to the inhabitants of Dunse. As in many other parishes, cock-fighting was the principal amusement during the forenoon, and, at one period, it seems to have been in high estimation. The parish school, which was set apart for it is described as having been sometimes crowded to the door, and the fees collected on the occasion formed a perquisite of some value. It is certainly to the honour of the present generation that this practice has disappeared.

The amusements of the afternoon are both more peculiar and inviting. The game is ball, played in a manner which, if not peculiar to Dunse, is at least not common. Preparations for it used to begin nearly a week before. Three young men were chosen to conduct them, and were called "ba'-men." They met on the Wednesday of the preceding week, to hold, along with their friends, the shaping of the ball, when they paraded the town, accompanied by a drum and fiddle, playing the tune,—

"Never let the gree gang doon
For the gude o' our loon."

In this style they called at the houses of the more respectable inhabitants, danced with the servants, and received contributions.

Till the day itself arrived, their only duties were to collect these contributions and prepare the balls. Three are required for the game, but four are always prepared. The family at Dunse Castle have so liberally supported the practice, that it has been customary to leave there one of the balls, which it is said are preserved. Of those played

with, the first is gilt, and called the "*golden ball*," the second, from its colour, is called the "*silver ball*;" the third is spotted.

About eleven o'clock in the forenoon the honour of throwing off the ball was at one time exposed to auction, in the churchyard, over one of the tombstones. The arrangement of the working classes in Dunse, under the different trades, was at that time much more complete than at present; and it was a subject of considerable competition among them who should have the honour of throwing up the ball. My informant states it as a very early recollection, that the whip-men (carters) bought it for fifteen shillings,—a sum which, making allowance for the difference of the value in money, shews the estimation in which it was held. The children of the Drummelzier family, or of the more respectable families in Dunse itself, have of late enjoyed the honour, but it has not unfrequently been left to the ball-men themselves.

It was from the top of a small building that stood close to the old Town-house, that the ball was usually thrown. Since that was taken down, it is simply from the street. About one o'clock the shops are shut,—the golden ball is thrown off, and the game begins.

The opposing parties are the married and unmarried men. Their object is not to kick the ball, but to snatch it up and carry it off. This, however, is exceedingly difficult. It is thrown into the middle of the crowd, and whoever happens to gain it, is sure that hundreds will rush on him from every point. The scenes to which this leads, are, as may be supposed, exceedingly varied and amusing. At one time the crowd is rolled together in a mass, every individual in which is making the greatest exertions to gain or retain the ball. And should the possessor of it be able to escape, or to throw it to any distance, the rush which is made, and the eager pursuit, exhibit a very animated sight. The game of the married men is to carry the ball into the church, the doors of which are set open on the occasion. The unmarried men endeavour to reach any mill in the parish, and put the ball into the hopper.

The contests, though conducted in good humour, are usually very determined, and when the game was in higher estimation than at present, it is said that accidents sometimes happened from the pressure of the crowd.

Though the unmarried men might carry the ball to any mill in the parish, they generally endeavour to reach Clock-mill, about half a mile to the west of Dunse. It was once customary, therefore, for a party of their opponents to be stationed before it, and many a hard contest took place there. The parties, however, scarcely met on equal terms. The young men, spent with previous exertion, were no match for these fresh opponents; and it not unfrequently ended in their being plunged in the mill-lead. If, however, in spite of all opposition, the mill-hopper was fairly reached, the game was won. And then came their honours.

The miller entertained them with pork and *dumplings*; and, what was of far more importance, dusted them, especially their hats, with flour. Like the laurel wreaths of other regions, this marked them out for the gaze of their fellow-townsmen.

In this way the three balls are played for successively. The person who succeeds in *kirking* or in *milling*—such are the phrases—the first or golden ball, receives from the ball-men a reward of 1s 6d., for the second 1s., and for the third 6d.

I have no means of ascertaining the antiquity of this practice. The oldest inhabitants tell us that, ever since they recollect, it has been falling off. It seems indeed at one time to have been engaged in with much greater spirit. Whoever did not play was marked, and the inhabitants not unusually assembled next day to inflict punishment. They dragged him forth—carried him down to the cross, and, as is said, knocked him against it. When one thinks of the population, leaving for one day their laborious occupations, and entering with spirit into the excitements of this game, he would be a stern moralist who would forbid them the enjoyment. But every picture has its darker shades. The evening was generally spent in dancing and drinking. It was remarked too, that if any private quarrels had arisen, they were one way or other settled and set at rest on Fastern's E'en.

On the Aurora Borealis. By Mr WILLIAM BAIRD.

IN the winter season of the year, when botany can no longer afford its usual animating enjoyments to the lovers of flowers; when the birds, which made our summer groves vocal with their music, are silent, and seldom to be met with by the ornithologist; when the greater part of animated nature, in short, is either dead, torpid, retired to their holes and caves for shelter from the severity of the weather, or seeking by a rapid flight new summers in a warmer clime; when even the few pursuits which the botanist or zoologist has still within his reach are further interrupted by the inclemency of the season, "vapours, and clouds, and storms," or by the shortness of the days, "which driving sleets deform," the meteorologist can still find full employment for his powers of observation. The storms and blasts of winter all contribute materials for his peculiar studies. Pleased, he

"Hears the winds roar, and the big torrent burst,
Or sees the deep fermenting tempest brew'd
In the grim evening sky."

The ever varying state of the clouds affords him constant amusement, whilst he derives great delight and satisfaction in watching, by means of the barometer or sympiesometer, the frequent changes in the pressure and density of the atmosphere. Many meteorological phenomena

of a more interesting nature still are of frequent occurrence at this dead season of the year, and well deserving the notice of the observer of nature. As few phenomena of this character have hitherto been taken much notice of in this Club, I shall make no apology for introducing to you some observations made upon a very beautiful phenomenon, which has been exhibited in great brilliancy several times since our last meeting—I mean “those dancing meteors” that ceaseless shake “a waving blaze, refracted o’er the heavens”—the Aurora Borealis. I do not intend making any detailed remarks upon the theories connected with this interesting phenomenon, but merely to describe the appearances as I witnessed them upon two occasions since our last meeting, within this district, and then make a few observations upon the state of weather following their appearance. The first occasion alluded to was the 18th of September last, the evening of our last anniversary meeting, upon which evening I observed the phenomenon in great splendour whilst travelling from Dunse to Cockburnspath. As soon as daylight had disappeared the phenomenon commenced being visible, and as the evening advanced it waxed more and more brilliant; and though, for some part of the time, a clear moon of five or six days old shone with considerable brightness, it did not at all impair the brilliancy of the “waving blaze” of the aurora. At first there was observed a white arch, resembling a light cloud of the “Cirrus” formation, extending over the northern horizon nearly from east to west about 20° or 30° above the horizon. This at first was faint, while some remains of daylight lingered on the hills, but gradually, as the evening became darker, the arch waxed brighter, and then we were made sensible of its unsteady blaze, now fading away, till only a dim arch could be seen, and anon suddenly starting forth to its original brilliancy, but never altogether disappearing. Soon afterwards, perhaps half an hour after the arch became visible, jets of white light shot forth from the edge of the arch in one or two places, and streamed over to the zenith. As these disappeared, fresh portions of the arch shot forth fresh streams of liquid light, which blazed over half the heavens, disappearing in their turn as rapidly as they formed, and anon being replaced by fresh and more brilliant streams, till at times the whole northern half of the sky blazed bright with the flickering meteors. From the west side of the arch long tapering streams shot forth in a slanting direction towards the zenith, in the centre beautiful straight jets tapered up towards the same point of the heavens, while, from the eastern portion of it, long splendid streams slanted their fine points upwards, and all three parts converged their points towards the zenith, like the radii of a circle. While this brilliant display lasted, occasionally a smaller arch of white light would form a few degrees above the larger one, and from its edges smaller and much shorter jets would be frequently sent forth, which, beginning towards one extremity, would sometimes dance and leap, and run in the most extraordinary manner

along its upper edge, and now and then assuming prismatic colours, recalled to our minds an exhibition of the figures of a magic-lantern upon a most magnificent scale. Well may they be named the "merry dancers," and well might the more savage nations of the north, in former ages, fancy, in such exhibitions as these, they saw the powers of the air holding their high revels in the clear sky.* This splendid display of these beautiful meteors continued for nearly two hours, when they gradually decreased, became dim, and finally disappeared. On the other occasion alluded to, a different, but more magnificent display still, took place, which I observed whilst at Yetholm about the middle of October. The night was still and calm, not a breath of wind was to be felt; the moon was within a few hours of its change, and consequently was not visible. About eight P.M. upon going out, I was surprised at the brightness of the night, and, distrusting my knowledge of the moon's age, I looked aloft to see if that luminary was visible. The first glance of the sky explained the brightness of the night, and at the same time filled me with astonishment. The whole welkin, from east to west, was in a blaze of light; and I remarked that, though there was a bright space stretching for some degrees above the horizon in the north, the grand display of the streaming meteors was from east to west, while at the same time the few that came from the north stretched to the zenith, and some from the west shot up in that direction also, and from all the three points converged towards the centre of the sky. Words cannot do justice to the magnificent scene,—the streams of light were in constant motion, moving with vast velocity, and often sheets of liquid light stretched over a great space of the sky, suddenly disappearing, and being replaced by magnificent long sharp-pointed pencils of light, which darted up to the zenith in one continued blaze. Once or twice, when a more than usually brilliant display took place, and was accompanied with these sheets of light, I thought I distinctly heard a noise, resembling exactly the sound of a sudden but gentle breeze of wind amongst the trees,—a low, soft, but momentary gush of sound, as it were, not unlike the noise of the quick flight of a bird overhead. I looked to the shrubs and some short trees near me, but not a twig nor a withered leaf was in motion: it could not have come from them. A mill-lead was within a few hundred yards of me; and, from the stillness of the night, its noise could be distinctly heard from where I stood; but the sound I have mentioned was not, to my ears, the sound of falling water,—neither was there any bird to be seen. As I never before heard a similar sound during a display of the aurora, and as the noise, generally said to have been heard, is described as a crackling noise, I satisfied myself at the time that it must have been the noise of the water only

* On the appearance of this meteor, the dogs of the hunters on the shores of the White Sea lie down in terror; and the name given to the meteor by these hunters is (translated) the raging host is passing!

partially conveyed to my ears, or that it was the effect of imagination ; but I was afterwards informed that the same sound was heard on the same evening, in the neighbourhood of Cockburnspath, and the hearer describes it as somewhat resembling the low but quick flap of a bird's wing. I state this with much diffidence, however, well knowing the discrepancy of opinion upon this point. A few nights after this, there was another almost equally brilliant display, and since that they have been of no unfrequent occurrence, though not to any extent.

It is a general opinion that a bright or frequent display of these beautiful meteors betokens bad weather ; and though I am not acquainted with the results which learned men have come to upon this subject, I am aware that this inquiry has called forth the observations of several meteorologists, and that the scientific M. Arago of Paris, in particular, has bestowed much attention on the subject, and I believe has had frequent communications from naturalists in this country concerning it. I am sorry that I cannot bring forward here, a detailed account of the weather as it immediately succeeded the appearances I have attempted to describe ; and owing to the delay attending the forwarding of his meteorological instruments from Edinburgh, I have not been able to avail myself of the meteorological diary or journal which the Rev. Mr Wallace of Abbey St Bathans some time ago kindly promised to furnish the Club with, and with which I had hoped to have been able to supply the want of my own observations. A general recollection, however, remains of the weather following these appearances, which will, perhaps, be sufficient, in the meantime, to shew the probability of the opinion, that they are precursors of stormy weather. The day following the first exhibition, the sky in the forenoon presented the appearance of an immense number of finely pointed and waved linear "cirri," not very unlike the long streams of light seen on the preceding evening. These soon became mixed with the "comoid" variety of "cirrus," or mare's tails, accompanied with some specimens of the "plumose" variety, which latter varieties are generally acknowledged by meteorologists to be precursors of wind and rain. The latter part of September, it will perhaps be remembered by many, was characterized by blustering changeable weather, storms of wind arising at frequent intervals, shattering the trees, and stripping them of their leafy glory. Owing to their being chiefly from the west, however, little or no damage was done on this coast. About twenty-four hours after the appearance of the second display I have mentioned, a fierce storm of wind arose, accompanied with heavy showers of rain : the weather became cold and dismal, and on the 14th October the Cheviot Hills, a little to the south of Yetholm, were covered with snow. About the same time the Tweed and Teviot were swollen to their banks, and a series of broken and severe weather continued for some time. Frost and snow since then have been but little felt, but it cannot have escaped the notice of all the members of the

Club, what fierce and great storms have raged for some time back, and what lamentable disasters at sea have filled the columns of our journals. Being chiefly from the westward that these fierce storms have blown, this coast has suffered but little, but the coasts of the west of Scotland, England, and Ireland, have teemed with shipwrecks, death, and desolation; hundreds of lives have been lost, and property to an immense amount irrecoverably lost and destroyed. Ninety thousand tons of shipping have been calculated to have been lost this year, and a large part of this immense loss has happened within the last three months. The observations of one individual, and the inferences to be deduced therefrom, are of little value by themselves, and I only offer these few remarks as a contribution towards a subject of great interest, and well entitled to further inquiry, and as they may be useful by way of comparing with the observations of other individuals upon the same subject.

Notice of the Herling of the Solway being found in the Tweed, with some Observations on its Habits and Distribution. By Sir WILLIAM JARDINE, Bart.

AMONG the many species of fish which inhabit or occasionally resort to the rivers of this country, the family of the Salmonidæ contain by far the most important part, and the rents arising from their capture form a considerable amount in the value of the fisheries of Great Britain. The species whose habits I shall now attempt in part to describe, is not of itself sufficiently important to form a large article of commerce, or to rank for much value in the accounts of the taxmen of the fisheries, though I believe that in many districts, and particularly in the western coast of Scotland, much more might be made from it; but at the first appearance of decrease in the salmon fisheries, it was conjectured by many of the proprietors that this fish was the fry or young of the salmon; while it was advanced by others, as an argument against this, that it was not found in either the Tay or the Tweed, two of the most important salmon streams in Scotland. In some rivers nets of less than a certain width of mesh were not allowed; but on the part of the taxmen it was of consequence to make it out distinct, and to supply the markets as far as they could. In this way a point of much importance was involved, for had the herling been proved to be the young salmon, some additional means must have been necessary to preserve them from a destruction which in some rivers is immense. It is now generally known to be a species entirely distinct, though proper characters have not been affixed to it, and I regret that I cannot now give them with satisfaction to myself, less from the want of materials, as from being unable to compare and contrast them with some of their

congeners.* I propose, therefore, to confine my present observations to those habits which have come under my own notice.

This fish I consider to be the *S. Albus* of Fleming, the *Herling* or *Hirling* of the Scotch side of the Solway Frith, the *Whiting* of the English side, and by which name it is also known in the Eden and Esk, the *Phinnock* of the north and west of Scotland, the *White or Phinnock* of Pennant, and the *Silver White* of the Tweed tacksmen.

In the Solway Frith (where I have had the most frequent opportunities of observing them), they commence their approach to the mouths of the rivers about the middle and towards the end of June, if the season has been remarkably dry, and perhaps a few days earlier if there has been much rain. From this time they continue running till about the end of August, when the greatest body of the shoal is either past or taken. The height of the run, however, may be said to be about the last weeks of July, and their numbers at this time are almost incredible. In the rivers they are caught with the common sweep-nets, in the Frith by the stake-nets of small mesh, or, as they are called, herling-houses. Many hundreds are taken at once in each enclosure at every tide;—the whole neighbourhood are for a short time supplied with them;—cart-loads are sent for also to Ecclefechan and Lockerbie and the surrounding villages, and I have once or twice known them reach Moffat, a distance of above thirty miles from the nets. This abundance, with little exception, seems general wherever they are found.

They enter the fresh waters for the great business of spawning, and I have observed that in the larger rivers, the great body of the shoal leave the main stream and seek the smaller tributaries, and very few remain where the water continues strong and heavy. The spawning commences earlier than that of the salmon, is of course sooner finished, and by the end of February almost the whole of the old fish have returned to the sea. The young I have never been able to see; it is probable, however, that they are hatched earlier, and make their way to the salt water when of a small size, and three or four months is a sufficient interval for them to have obtained the size and weight of their appearance in the following June.

It may be noticed as remarkable in the history of this fish, and at variance with the habits of the other British salmon, that from the time of the return of the old fish or kelts to the sea, not an individual is seen till the appearance of the great shoal: a few days before stragglers appear, and they are the signals for preparations being commenced for their destruction; but in the intervening four months between March and the end of June, they are never to be met with. In this respect they more resemble the Coregoni, which are completely

* Gill covers, . . . 11
Fins D, . . . 14
— P, . . . 14

Fins V, . . . 11
— A, . . . 12
Vertebræ, . . . 60

gregarious, and also the herring, to which I believe the above mentioned genus leads.

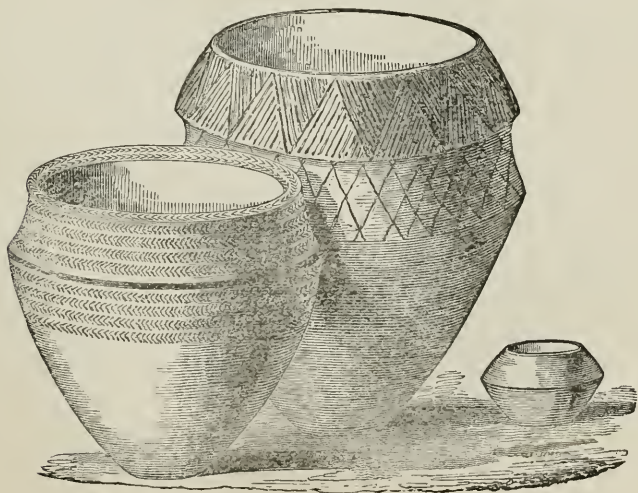
The fish in the Solway very seldom reach 2 lb. in weight. Upon their first arrival $\frac{1}{2}$ lb. and $\frac{3}{4}$ lb. is a common size, afterwards the greater proportions average from 1 lb. to $1\frac{1}{2}$ lb. One of the most marked appearances of this fish, is the great proportional breadth of the back, and the peculiar greyish-green colour of the upper parts. This colour appears very conspicuous when seen before the water has completely ebbed from the stake-nets, when the fish swim near the surface; and when small sea-trout are mixed with them, the contrast is at once perceived. The distribution of this fish in Scotland, as far as it can be with certainty traced, is pretty extensive; the south and west coasts, however, seem to possess the greatest abundance. Commencing at the Solway, we meet it in great abundance as far as the Dee at Kirkeudbright, from thence we lose it till the mouth of Loch Awe at Loch Etian in Argyllshire, from this it is common along the whole of the west coast. On the east it is plentifully found at Inverness, and I have traced it at Peterhead, but from this point to the Tweed, I have been unable to hear of it. Wales is the only district in the south where it will probably be found thus following the west coast, and the sewin will most likely prove our Scottish hirling or whiting. It has not yet been noticed in any part of Ireland.

Regarding this fish being occasionally found in the Tweed, it seems to vary in the gregarious habit, comparatively few being met with. Among the tacksmen the Solway name was not known, but upon describing the fish to them, they at once referred it to their silver white. The matter was, however, soon proved, by having the good fortune to catch one when fishing salmon with Stevenson, the tacksman of the Crown fishing. We had made frequent inquiries at the different tacksmen regarding it, and when the fish rose, Stevenson at once called out that it was a silverwhite, shewing that he was perfectly acquainted with it. It corresponded with all the characters of the Solway fish, having the same number of vertebræ, rays in the fins, and gill-covers, &c.

As far as I can learn, they are not abundant in the Tweed. They are perfectly well known at Coldstream, and are taken with whitling flies; and Stevenson mentioned having once taken about fifty opposite Birgham in one draft of a sweep-net. I have been unable, however, to trace them farther up than Kelso, and though fishing much with suitable flies, I have never seen them in the higher waters of Dryburgh or Merton. The stream of the Tweed and larger rivers may probably be too heavy and powerful for them, and it is probable that the great proportion of those which do enter the Tweed will diverge at the spawning season to the smaller tributaries.

Notice of some Roman Urns recently discovered near Berwick-upon-Tweed.
By DR JOHNSTON.

THE urns, of which figures are annexed, were lately discovered at Murton, in the northern part of the county of Durham, and about four miles from Berwick-upon-Tweed. They were buried, at no great depth, in a light sandy soil raised into a sort of low mound, and were covered or intermixed with stones disposed without order. The small one was perfect, the two larger were broken into many pieces, but, by fitting these together, a perfectly correct idea of their shape and sculpture was obtained. The small one exactly resembled an old-fashioned salt-cellar; the diameter of its mouth was nearly $2\frac{1}{4}$ inches, the greatest circumference 10, and the height 2 inches. The height of the second was 6, the diameter of its mouth $5\frac{1}{2}$, and the greatest circumference 20 inches. The third was a size larger; and fragments, evidently belonging to still larger urns, and of different patterns, were also procured from the same place. All of them were made of the coarsest clay, such as is still found near the spot where they were buried, and were so brittle, although half an inch thick, that it was found impossible to remove them uninjured from the soil. They had not been burned, but merely dried in the sun or in an oven, and from the blackness of their interior, even this does not seem to have been done perfectly. The sculpture on the exterior was of the rudest and simplest kind, and executed probably with the trowel or a knife. They were filled with a fine black dust or ash, and in some of them fragments of bone were detected, which mouldered away on exposure to the air. The small urn might be destined to hold the ashes of the heart. To none of them was there a lid or cover.



These are evidently sepulchral urns of Roman manufacture, and the coarseness of the material, and the rude fashion in which they are ornamented, prove the ashes they contained to be those of some ignoble persons,—

“—to fortuné and to fame unknown.”

Similar urns have been dug up occasionally in other places in this neighbourhood. Two were procured from a gravel bank at Billymire, in the parish of Chirnside, about 1790 (Stat. Acc. v. xiv. p. 30); and “in 1792, on clearing the ground of a heap of stones which had been collected upon the top of the Crimson, or Crameston Hill, on the north side of the village of Gavinton, several earthen urns, of different sizes, were dug up. The urns contained human bones, but had no inscription upon them.” (Ibid. p. 584.) I have seen the fragments of two very large ones in the possession of the Rev. A. Baird of Cockburnspath, which had been procured near that village; and Mr Selby has met with several near Twizell-house. For the possession of those under notice, the Club is indebted to the attention of the Rev. Mr Campbell of Tweedmouth.

Since sepulchral urns were never placed by the Romans in temples, but in fields and by high-ways, the situation of the present may possibly serve to indicate the precise line of the great northern road of that people, called the *Devil's Causeway*; and from the name of a hamlet—*Camp-houses*—in the immediate vicinity of Murton, we may conjecture that they had also a military station here, which is the more probable, as the remains of a Roman camp are still visible on the banks of the Tweed, near West Ord, which is not more than between two and three miles distance from Murton.

To ascertain the precise antiquity of these remains I can make no essay, but a conjectural approximation to it may be allowed. Notwithstanding the stories to the contrary in the Scottish Chronicles, it may safely be taken for granted that the Romans had not penetrated, or at least made any settlement in our district, until Agricola led his armies northward, about the year 80. They withdrew finally from Britain in the year 426; and although they did not occupy our district during the whole of the intervening 346 years, having been repeatedly driven beyond Adrian's Wall by the Picts and Scots, yet they generally repossessed themselves of it in a short time, and certainly had encampments in it until within a very short period of their removal. But assuming the latest date for their burial, the urns before us possess all the interest attached to antiquities, upwards of 1400 years existence,—a larger one than any monument of the border warrior can claim. “In vain we hope to be known by open and visible conservatories, when to be unknown was the means of their continuation, and obscurity their protection.”—Sir T. Browne.

Note.—Since the above notice was read, I have received from Mr

Brodie of Ayton Mill, a very perfect urn, rather more than four inches in height, and six in diameter, which was found by him, about fourteen years ago, under a heap of stones on Bell's-hill, opposite St Abb's Head, in the parish of Coldingham. In shape, sculpture, and material, it agrees nearly with those figured, and was full of a fine black ash.

A Note relative to Ceanthe crocata. By Dr JOHNSTON.

IN the appendix to my Flora; it is stated that no yellow juice could be found in any part of our Berwickshire *Ceanthe*, and I was hence led to conclude that it was more probably *C. apiifolia* of the British Flora. Mr Winch informs us that the same remark had been made in regard to the plant near Newcastle; and I have been well informed that the Edinburgh botanists were equally unsuccessful in finding any yellow juice in their plant. Such being the fact, I was not a little surprised and pleased to receive from Mr Dunlop, roots of *C. crocata*, from the banks of the Eye; and from which, when broken, drops of a deep orange-yellow juice immediately exuded. There was no doubt, then, that these belonged to the true *C. crocata*; and as the leaves, &c. differed in no respect from those I had previously examined, I was led to re-examine roots from other stations, and the result has been a conviction that the species is every where the same with us, although the juice is often very scanty, and sometimes scarcely visible. Thus, roots dug on the Castlehills, when broken, continued white for some time, but the fracture ultimately assumed a yellowish hue, and when narrowly looked at, minute yellow dots were seen scattered over the surface. The quantity of juice, and its intensity of colour, probably depend on the nature of the station the plant has selected, being deep-coloured when growing in drier, and pale, or almost colourless, when in very wet places.

Additions to the Flora of Berwick-upon-Tweed.

(Continued from page 32.)

DICOTYLEDONES.

CENTUNCULUS MINIMUS—*Small Chaffweed.* Near Lithtillum Loch, Birgham Muir, Miss Hunter.

GALIUM MOLLUGO, var. *G. scabrum*, *With. Bot. Arrang.* ii. 190. In a field at Anton's Hill, Miss E. Bell. On the north side of the Hirsell Lough, and on the Hirsell grounds, Miss Hunter and Miss E. Bell.

Pyrola secunda—*Serrated Winter-green*. On Yeving Bell, Northumberland, sparingly, Dr Johnston and Rev. J. Baird. This pretty plant is not uncommon in fir woods in the Highlands of Scotland, but it has always been considered one of the rarest of English plants, and this is its first and only habitat in Northumberland. Wallis, indeed, says, that the "small winter-green, with roundish serrate leaves," grows plentifully on the borders of Ramshaw Wood; but Mr Winch tells us that he has sought for it there in vain; and after examining Wallis's description, we entertain no doubt whatever that his species is really *Pyrola minor*, a plant that had not been accurately characterised when the History of Northumberland was published.

Rhamnus catharticus—*Common Buckthorn*. Sea banks at the mouth of Dunglass Burn, Rev. A. Baird.

Rosa inodora, Hook. Brit. Flor. i. p. 233. At the base of Yeving Bell, intermixed with other species, Dr Johnston.

Rosa villosa, Hook. Brit. Flor. i. p. 230. On Yeving Bell; and frequent in the deans and ravines of Berwickshire, Dr Johnston.

Stellaria nemorum, *Wood Stitchwort*. On an island in the Tweed, between Cornhill and Lees, on the Scotch side of the river, Miss E. Bell. To the west of Wark, under some willows on the side of the Tweed, Miss Bell.

Trifolium fragiferum—*Strawberry-headed Trefoil*. North side of the Whiteadder, from the Blue-stone ford to near Edington Mill, and by the hedges on the farm of Nethermain, in the parish of Chirside, Mr Henderson. Side of the Whiteadder, at Gainslaw Bridge, Mr P. W. MacLagan.

CRYPTOGAMOUS.

Hypoxyla.

Sphæria polymorpha. On stumps of trees in the Hirsell woods; not common.

Histerium rubi. On decayed branches of *Rubus fruticosus*, in the plantations at the Retreat, Dr Johnston.

Fungi.

Helvella mitra. Bankhead wood, near Eccles, October 1833, Dr R. D. Thomson.

Boletus edulis, *Greville*. Hirsell woods, Dr Johnston.

Agaricus applicatus, *Withering*. On rotten wood in the Hirsell plantations, Dr Johnston.

Lycoperdaceæ.

Licea fragiformis. On rotten willow trees at Horsykend, in November, Dr R. D. Thomson.

Uredineæ.

UREDŌ EUPHORBÆ, *Bot. Gall.* ii. 896. On the under surface of the leaves of *Euphorbia Helioscopia*; frequent in gardens at Eccles, Dr R. D. Thomson.

ÆCIDIUM ASPERIFOLIUM, *Bot. Gall.* ii. 906. On the leaves of *Lycopsis arvensis*, near Coldstream, Mr R. Embleton. On the same plant in Holy Island, Dr Johnston.

UREDŌ VALERIANÆ, *Bot. Gall.* ii. 898. On the leaves of *Valeriana officinalis*, in autumn, near Berwick, Dr Johnston.

PUCCINIA ADOXÆ. On the leaves of *Adoxa moschatellina*, in Langton Wood, Mr T. Brown.

Mucedineæ.

EUROTIIUM ROSARUM, *Grev. Crypt. Fl.* tab. 164, fig. 2. On the unripe fruit of various roses in several parts of Berwickshire, Dr Johnston.

HELMISPORIUM VELUTINUM. On a branch of decaying sycamore in the Hirsel woods, Sir W. Jardine.

HELMISPORIUM CHÆLOSPERMUM, *Bot. Gall.* ii. 929. On the dead straw of the oat, Mr T. Brown.

Plants for which no Berwickshire Habitats are mentioned in Dr Johnston's Flora.

ARUNDO ARENARIA. Links about half a mile south from Coldingham sands, not plentiful, Mr A. Carr.

CARDUS NUTANS. In fields about Edrom, and at Mayfield, Mr R. Dunlop. Probably introduced with clover-seeds.

CLINPODIUM VULGARE. Birgham Haugh, Dr R. D. Thomson.

CYNOGLOSSUM OFFICINALE. On Coldingham shore, plentiful; and about Halidown farm, sparingly, Dr Johnston.

ENDOCARPON WEBERI. Stitchell Linn, Mr T. Brown.

HIERACIUM UMBELLATUM. On the Edinburgh road near Hatchetnize, Miss Bell.

MENTHA GENTILIS. Sides of the Whiteadder, from its mouth to Edington, occasionally, and intermixed with *M. hirsuta*. Mr C. C. Babington.

LEPIDIUM CAMPESTRE. Banks of the Dean, Dunglass, Rev. A. Baird.

POTERIUM SANGUISORBA. On the banks of Coldingham Lough, very sparingly, Mr Mitchell.

RANUNCULUS LINGUA. Ferneyrig and Lithtillum Lochs, plentiful, Dr R. D. Thomson. In a bog at Craig's Walls, parish of Edrom, Mr Henderson.

VACCINIUM OXYCOCCUS. In a bog to the north of Sweethope Farm-house, plentifully, Mr T. Brown.

SEDUM VILLOSUM. On the Lammermuirs in the parishes of Longformacus and Westruther, plentiful, Mr T. Brown. Ecklaw Edge, parish of Cockburnspath, Rev. A. Baird.

PLANTS IMPERFECTLY NATURALISED.

ACONITUM NAPELLUS. Banks of Wooler Water above Haughhead, Northumberland, Mr Mitchell.

ANCHUSA SEMPERVIRENS. In a small dean near Ninewells House; road side between Reston and Reston-mains; and by the road side at Mordington Church, Mr Henderson.

APIUM PETROSELINUM. Banks of the Tweed near Fireburn Mill, Berwickshire, plentiful, Miss Bell.

ASTER SALICIFOLIUS. Banks of the Leet behind the Hirsell Woods, but planted there, Mr R. Embleton.

BROMUS SECALINUS. In a wheat-field at Spittal, North Durham, with *Lolium arvense*, abundant, (the wheat-seed came originally from the Isle of Wight); occurs also in corn-fields occasionally throughout Berwickshire, Dr Johnston.

HIERACIUM AURANTIACUM. Pease Bridge Woods, Rev. A. Baird. In Hirsell Woods, Miss Hunter, but evidently an outcast of the garden. Miss Bell finds *Aquilegia vulgaris* and *Narcissus pseudo-narcissus* in the same woods, and of their garden origin no doubt can be entertained.

IBERIS AMARA. Tweed side near Lennel Church, Miss E. Bell. Bed of the Tweed above Coldstream, Mr Embleton. Bed of Ale Water, Dr Johnston.

LONICERA CAPRIFOLIUM. Common near Coldstream in woods and hedges, Miss Bell.

LYSIMACHIA NUMMULARIA. Dunglass Dean, Rev. A. Baird.

MEDICAGO SATIVA. Has naturalized itself on the banks of the Whiteadder near White-hall, Mr Henderson.

RESEDA FRUTICULOSA. On the ballast behind Berwick Pier, 1832, Mr R. Dunlop. Has disappeared, 1834, Dr Johnston.

RUMEX MARITIMUS. On the shore behind Berwick Pier, introduced with ballast, 1832, Mr R. Dunlop. Has disappeared 1834, Dr Johnston.

SOLANUM NIGRUM. On the ballast behind Berwick Pier, plentiful in 1832, Mr R. Dunlop. Mr Manners could find only a single specimen in 1834.

ACER CAMPESTRE. Common in hedges about the Hirsell, where there are several trees of it that have attained considerable size, Dr Johnston. Handsome specimens of this tree occur on the south side of Dunglass Dean, Rev. A. Baird.

Habitats for some of the rarer Plants of the District, additional to those given in Dr Johnston's Flora.

DICOTYLEDONES.

ASTRAGALUS GLYCYPHYLLUS. Banks of the Whiteadder, a little beyond Claribad Mill, plentiful, Mr R. Dunlop. Banks of Wooler Water above Coldgate Mill, Northumberland, Dr Johnston. By the quarry at Whitehall, Mr Henderson.

ADOXA MOSCHIATELLINA. Banks of the Till opposite Twizell Castle, North Durham, Miss E. Bell and Miss Hunter.

ARENARIA VERNA. Banks a little north of Eyemouth Fort; banks above Earnsheugh, Mr A. Carr.

ARABIS THALIANA. Mouth of Lumsden Dean; remains of the old bridge over the Eye at Ayton Park, Mr A. Carr.

BETONICA OFFICINALIS. Banks of the Whiteadder at Whitehall, sparingly, Mr Henderson. About Houndwood, plentiful, Dr Johnston.

CARDAMINE AMARA. Wood opposite Carham Hall, Dr R. D. Thomson.

CICHORIUM INTYBUS. Twizel Castle, Dr R. D. Thomson. On the Cove Farm near Cockburnspath, Rev. A. Baird.

CHRYSOSPLENIUM ALTERNIFOLIUM. Near the Mineral well at Cornhill, Miss E. Bell.

CERASTIUM ARVENSE. Road side leading from Coldingham to the Lough, Rev. A. Baird.

CAMPANULA LATIFOLIA. Wooded banks of the Whiteadder below Chirnside Bridge, Mr R. Dunlop.

CONVOLVULUS ARVENSIS. Gravel pit on the Ayton road near the seven mile stone from Berwick, Mr A. Carr. Fields to the north of Eyemouth, Mr Henderson.

CENTAUREA CYANUS. Corn-fields about Lintlaw, plentiful, Mr R. Dunlop.

DAPHNE LAUREOLA. Bank below Whitehall, seemingly wild, Mr Henderson.

EPILOBIUM ANGUSTIFOLIUM. On a wild and rugged bank above Claribad Mill in great profusion; banks of the Whiteadder below Chirnside Bridge, Mr R. Dunlop. On the steep rocky bank, south side of the Whiteadder, about a quarter of a mile below Edington Mill, abundant, Mr Henderson. In a ravine above Ross, Dr Johnston.

EUONYMUS EUROPEUS. Banks of the Whiteadder above Claribad Mill, Mr R. Dunlop. In Humbletondean, near Wooler, Mr Mitchell. Cockburnspath Towerdean, Rev. A. Baird.

ECHIU M VULGARE. Very abundant by the side of the Whiteadder from Ninewells to Huttonhall Mill, Mr Henderson.

EUPHORBIA EXIGUA. Birgham-haugh, Dr R. D. Thomson.

FEDIA OLITORIA. Ravine above Ross; banks of the Eye below Ayton Bridge, Mr A. Carr.

FUMARIA CLAVICULATA. Stony places on the banks of the Dye near Longformacus, Mr T. Brown. In Elmondston Dean, and in Penmanshiel wood, most abundant, Dr Johnston.

GALIUM BOREALE. Not uncommon in the neighbourhood of Coldstream and Anton's Hill, Miss Bell. Roadside near Edrom, Mr T. Brown.

GENISTA TINCTORIA. Boggy ground on Birgham-muir, Dr Johnston.

GERANIUM LUCIDUM. Birgham-wood, Dr R. D. Thomson.

GLAUCIUM LUTEUM. Lumsden shore; very plentiful, Mr A. Carr. Sea-shore below Cockburnspath, Rev A. Baird.

GENTIANA CAMPESTRIS. Coldingham Muir, near the Lough; Birgham Muir, in profusion; and on the banks of the Dye above Longformacus; Dr Johnston.

HYOSCYAMUS NIGER. Near Eyemouth and Burnmouth, Mr Henderson.

HYPERICUM HUMIFUSUM. St. Foin; Bankhead Wood, Dr R. D. Thomson.

HIERACIUM SUBAUDUM. Penmanshiel Wood; and in the Peasebridge Dean, plentiful, Dr Johnston.

HIERACIUM SYLVATICUM. Penmanshiel Wood, plentiful, Dr Johnston.

LIGUSTRUM VULGARE. Peasebridge Dean, Mr A. Carr. Apparently indigenous there.

LOTUS CORNICULATUS, var. *B. Smith*. Near Buncle, Mr T. Brown.

LITTORELLA LACUSTRIS. Mill-pond of Northfield, plentiful, Dr Johnston.

MELAMPYRUM PRATENSE, var. *montanum*. On Yevering-Bell, Dr Johnston.

MALVA MOSCHATA. Banks of the Whiteadder near Whitehall, and by Covey-heugh on the banks of the Eye, Mr Henderson. Side of the Whiteadder about Blanerne; and most abundant in a field below Preston farm-house, Mr R Dunlop. Bridge over the Leet at Castlelaw, Dr R. D. Thomson. South side of the Whiteadder, a little below the Raven-knowes, Mr R Dunlop.

ENANTHE PHELLANDRIUM. In the Loch at the Hirsell, and in Lithtillum Loch, Miss E. Bell and Miss Hunter.

NASTURTIUM TERRESTRE. Lithtillum Loch, Dr R. D. Thomson.

NASTURTIUM SYLVESTRE. Tweedside at Lennel, and Birgham-haugh, Dr R. D. Thomson.

PARIETARIA OFFICINALIS. Vault on the site of the old church in front of Mordington House, Mr A. Carr.

PLANTAGO MARITIMA. One mile south of Bogend on the Kelso road, Dr R. D. Thomson.

PYROLA MEDIA. Dirrington-law, Mr T. Brown. In the wood opposite Bankhouse, Mr W. Baird.

ROSA RUBIGINOSA. Sea-banks near the shore, half way between Ross and Lamberton Shields, a single shrub, but perfectly wild, Dr Johnston.

RUMEX SANGUINEUS. In the woods at Whitehall, Mr Henderson. Langton Woods, plentiful, Mr T. Brown.

SANICULA EUROPEA. Banks of the Eye near Houndwood; and of the Whiteadder, near Whitehall, Mr Henderson.

SAXIFRAGA GRANULATA. Banks below Ninewells, Mr Henderson.

SYMPHYTUM TUBEROSUM. Near the mill-call above Huttonhall Mill; and by the side of the Whiteadder at Whitehall, Mr Henderson.

SAMOLUS VALERANDI. Ferneyrig bog; Learmouth bog, Miss Bell.

SALIX PENTANDRA. Near Langton House, Mr T. Brown. Base of Yeving-Bell, Dr Johnston.

SYMPHYTUM OFFICINALE. Post-road near Purvis Hall, Miss Hunter. Dunglass Dean, Rev. A. Baird.

SENECIO TENUIFOLIUS. On the Raven-knowes between Claribad and Edington Mills; in the lane between Edrington and Cocklaw, Mr R. Dunlop.

SAMBUCUS EBULUS. Banks of the Tweed and of the Leet near the Hirsell, Miss E. Bell and Miss Hunter.

SCABIOSA COLUMBARIA. About the Linn at Stitchell House, Mr T. Brown. Craigs below Nenthorn-Gerrick on the Eden, Dr Johnston.

THALICTRUM MAJUS. Dowlaw Dean, Mr Henderson.

THALICTRUM FLAVUM. Dunglass Dean, Mr Henderson.

TROLLIUS EUROPEUS. Very abundant in a plantation above Billy Mill, Mr Henderson. Bog south of Hardacres, Dr R. D. Thomson, in boggy ground below Lumsden, abundant, Dr Johnston.

TRIFOLIUM OFFICINALE. Plentiful on the banks of the Tweed about Coldstream, Miss Bell. Tweedside at Lennelhill and Birgham-haugh, Dr R. D. Thomson.

UTRICULARIA VULGARIS. Ferneyrig Bog, Dr R. D. Thomson.

VIBURNUM OPULUS. Base of Yeving-Bell, Dr Johnston. Lees' Cleugh, Mr T. Brown.

VERONICA SCUTELLATA. In the parishes of Langton, Longformacus, and Westruther, very general, Mr T. Brown.

VERBASCUM THAPSUS. Bank of Wooler-Water, near Coldgate Mill, Mr Mitchell.

VIOLA LUTEA. Banks near Earnsheugh Camp, plentiful, Mr A. Carr.

MONOCOTYLEDONES.

ALISMA RANUNCULOIDES. Loch Lithtillum, Dr R. D. Thomson. Pond on St Abb's Head, Mr A. Carr. In a bog below Lintlaw Farm-house, Mr R. Dunlop.

ARUM MACULATUM. In a hedge at Whitehall, Mr Henderson.

ALLIUM VINEALE. Banks of the Eye, near Ayton House, Mr A. Carr.

BLYSMUS COMPRESSUS. Side of Whiteadder above and below Clari-bad Mill; and very plentiful in a bog a little west of Blannerne House, Mr R. Dunlop.

CAREX LEVIGATA. In the brushwood at the base of Yevinger Bell, with *C. remota et paniculata*, Dr Johnston.

LEMNA TRISULCA. Pond behind Heughhead farm-house, Mr A. Carr.

LISTERA OVATA. Banks of Eye at Coveyheugh, Mr A. Carr.

ORCHIS CONOPSEA. Banks about Coldingham Lough, and the Mill-pond of Northfield, Dr Johnston.

SCIRPUS LACUSTRIS. Ferneyrig Bog, Dr R. D. Thomson.

SCIRPUS SYLVATICUS. Birgham Wood, Dr R. D. Thomson. Banks of the Eye, below East Reston, Mr A. Carr.

TYPHA LATIFOLIA. In an old marl-pit at Craig's-walls, Mr Hender-son. In a pond near Crumstane, plentiful, Mr R. Dunlop.

TRITICUM CANINUM. Whiteadder at Hutton Hall, Dr R. D. Thom-son.

CRYPTOGAMOUS.

ASPIDIUM OREOPTERIS. Edmondston Dean, Dr Johnston.

ASPIDIUM ANGULARE. Dunglass and Cockburnspath Tower Deans, Rev. A. Baird.

ASPIDIUM ACULEATUM. Dunglass Dean, Miss Hunter. Twizelglen, Miss E. Bell.

BOTRYCHIUM LUNARIA. On the moor above Mayfield, plentiful, Mr R. Dunlop.

POLYPODIUM DRYOPTERIS. Lamington Dean, abundant, Mr Hender-son. Edmondston Dean, in great profusion, also on Yevinger Bell, Dr Johnston.

ANOMODON VITICULOSUM. Pease Dean, in fruit, Rev. A. Baird.

HOOKEERIA LUCENS. Boggy places on Dirrington, and in Langton Lees' Cleugh, Mr T. Brown. Dunglass Dean, abundant, Rev. A. Baird.

HYPNUM UNCINATUM. Near Buncle, Mr T. Brown.

HYPNUM ALOPECURUM. In fruit in Langton Lees' Cleugh, Mr T. Brown; and in Pease Dean, Rev. A. Baird.

ORTHOTRICHUM PULCHELLUM. At Longformacus, and near Gavin-ton, Mr T. Brown. Cockburnspath Tower Dean, Dr Johnston.

ANTHOCEROS PUNCTATUS. In a field east of Buncle, with *Riccia glauca*. Mr T. Brown.

POLYTRICHUM URNIGERUM. Near Fogo, Mr T. Brown.

PARMELIA AQUILA. Rocks at Sweet-hope and Hairy-heugh, Mr T. Brown.

PARMELIA CONSPERSA. Sweet-hope Craigs, Hairy-heugh Craigs Mr T. Brown.

STICTA PULMONARIA. Langton Lees' Cleugh, in fruit, plentiful, Mr T. Brown.

AGARICUS RUTILANS. Hirsel Woods, Dr Johnston. Bankhead Wood, Dr R. D. Thomson.

ARCYRIA PUNICEA. Bankhead Wood, Dr R. D. Thomson. Hirsel Woods, Dr Johnston.

ÆCIDIUM LACERATUM. On the fruit of the hawthorn on Yevinger Bell in June 1834, in great profusion, Dr Johnston.

ERINEUM PYRINUM. On the leaves of the crab-tree in Bankhead Wood, Dr R. D. Thomson.

POLYPORUS FOMENTARIUS. At Stichel House, Mr T. Brown.

PHASCIDIUM REPANDUM. On *Sherardia arvensis* about Eccles, Dr R. D. Thomson.

SCLERODERMA CEPA. In the Hirsel Woods, abundant, Dr Johnston.

A Catalogue of the Cirrhipeda found on the Coast of Berwickshire. By
Dr JOHNSTON.

I. CIRRHIPEDA SESSILIA.

1. *Balanus communis*, *Mont. Test. Brit.* p. 6. On the roots and stems of the larger Fuci, on stones from deep water, and on crabs, common.

2. *Balanus Balanoides*, *Mont. Test. Br.* p. 7. On stones, fuci, and the shells of crabs, common. This species exhibits the interior cellular structure of the valves in a very distinct manner.

3. *Balanus punctatus*, *Mont. Test. Brit.* p. 8, *pl.* 8, *fig.* 5. This is by much our commonest species, and literally covers the rocks between tide-marks, for it is never found within the lines of low water, as the preceding usually are. When young the shell is smooth and oval (*Lepas convexula*, *Penn. Br. Zool.* iv. 150, *pl.* 38, *fig. med.*), but in its growth, pressed upon and constrained by others, it becomes irregular in its outline and rough. On the Berwickshire shores it seldom exceeds the quarter of an inch in diameter, and is about the same in height, but from the neighbourhood of Bamborough I have specimens nearly an inch long, the height exceeding three times the measurement of the base.

4. *Clitia striata*, *Leach*. *Lepas striata*, *Penn. Br. Zool.* iv. 148, *pl.* 41, *fig. inf.* *Balanus striatus*, *Mont. Test. Br.* p. 14. *Creusia verruca*, *Lamarek*. On the roots and stalk of *Laminaria digitata*, on shells and corallines, common.

II. CIRRHIPEDA PEDUNCULATA.

5. *Pentelasmis anatifera*, *Leach*. *Lepas anatifera*, *Lin*. *Anatifa lævis*, *Lamarck*. Adhering to a plank of wood cast on shore in the winter 1819-20. This is the shell which, little more than a century ago, was generally believed to be the embryo of the barnacle duck; and, in the year above mentioned, I had the tale told me by our fishermen, yet, it must be allowed, in a manner that showed they were very incredulous of a fable, to the truth of which very learned historians and theologians, and very observant naturalists, have deponed with the confidence and sincerity of eye-witnesses.

6. *Scalpellum vulgare*, *Leach*. *Lepas scalpellum*, *Lin*. *Pollicipes scalpellum*, *Lamarck*. On corallines, especially on *Tubularia ramosa*, not uncommon.

An Address delivered at the Fourth Anniversary of the Berwickshire Naturalists' Club, September 16. 1835. By ROBERT EMBLETON, President.

ON resigning the chair to which I was, by your kindness, elected, it is necessary that I should briefly recapitulate the proceedings of the Club for the past year. Before doing so, however, I must express, as one of the promoters of this Club, the pleasure and gratification I feel in seeing the hopes and expectations formed at its commencement so fully realized. Four years have now elapsed since its formation, and, if we regard what we have already accomplished with feelings of satisfaction, it cannot be deemed presumptuous to hope, that the labours of each succeeding year will afford additional matter for congratulation, and fresh inducement for exertion.

The last anniversary meeting was held at Twizell House, the beautiful seat of our late President, and was one of great interest. I need scarcely recall to your recollection the admirable address of our President on his leaving the chair; nor the satisfaction every member of the Club must have then felt at the approbation expressed by two of the most distinguished zoologists of the present day, Messrs Jenyns and Yarrell, who attended it, of the plan, objects, and probable advantages of our Club. No insects of any note were captured on our walk, which was necessarily a hurried one; but two or three good plants were found in Bradford Dene, viz. *Mentha gentilis*, *Sanguisorba officinalis*, and *Clinopodium vulgare*. At that time I laid before you the first part of my List of the Malacostraca of Berwickshire and North Durham, specimens of which were also exhibited; and Dr Johnston read a description of a new British shell (*Natica helicoides*), a specimen of which was shewn. The rest of the day was spent in inspecting the beautiful collections in the various departments of natural history belonging to Mr Selby.

Our December meeting was held as usual at Berwick. The day was such as to prevent our taking any excursion farther than the beach, and nothing of any novelty presented itself to our notice. The papers, however, which were then read were neither few nor unimportant. 1st, In the botanical department, Miss Hunter and Miss E. Bell furnished us with a list of some rare and additional species of the Cryptogamia of Berwickshire, amongst which may be mentioned, *Peziza hæmisphærica*, *P. sarcoides*, *Agaricus fragrans*; with *Polyporus betulinus*, *Cantharellus lævis*, *Merulius lachrymans*, *Dædalea confragosa*, &c., specimens of which were exhibited. 2d, An elaborate and interesting paper on the Entomostraca of Berwickshire was read by Mr W. Baird. This class of crustaceans, from their minuteness, and from the care and perseverance necessary for their elucidation, has engaged but little the attention of naturalists since the time of Müller; but, from the short

period since Mr Baird commenced their investigation, he has determined no fewer than eighteen species; and as the season was not the most propitious for them, we may look forward to the discovery of many not yet known to the naturalist; and there is no one, I am sure, more capable of doing justice to the subject than he who has undertaken it. *3dly*, A description, by the Rev. A. Baird, accompanied by many specimens, of those curious and fantastically formed productions, known by the name of "fairy stones," from the Fairy Glen, near Melrose, so beautifully described by Sir Walter Scott in the Monastery. *4th*, Notices of the occurrence of several rare and interesting species in Ornithology, Ichthyology, and Entomology, by the Secretary; ¹ also a list of the Bivalve Mollusca found on the coast of Berwickshire, illustrated by specimens, and remarks on the diversities in their organization and habits. *5th*, Additions to the previous list of the Malacostraca of Berwickshire and North Durham, which I laid before you at the previous meeting. On that day two more were added to those I had already determined; one, the beautiful *Pinnotheres Cranchii*, first found on the Devonshire coast by Dr Leach, was brought by the Reverend Mr Turnbull from Eyemouth; the other at the time was supposed to be a species new to the Fauna of Great Britain, and on referring it to Mr J. E. Grey of the British Museum, that opinion was confirmed. It is proposed to give to this species the name of *Galathæa nexa*, as forming a beautiful link between the *Galathæa squamifera* and *G. spinigera* of Dr Leach. Three specimens have only as yet been obtained, two in Berwick Bay, and the other near Embleton.

The next meeting at Allanton, a district through which flow the streams of the Blackadder and Whiteadder, so well known to the lovers of that recreation which honest Isaac Walton describes as "the most calm, quiet, and innocent of all," was one of the best attended;

¹ Of these notices we may particularize the following:—

"1. *Phalaropus lobatus*, *Grey Phalarope*. Shot in the Tweed at Berwick, by Mr Good, about the middle of November 1834.

"2. *Botaurus stellaris*, *Common Bittern*. A fine specimen was shot at Redheugh, parish of Cockburnspath, by Mr Johnston, on December 6, 1834. Mr Selby has a specimen in his collection, which was shot near Berwick.

"3. *Liparis Montagui*, *Flem. Brit. Anim.* p. 190. Occurs occasionally on the coals of Berwickshire, adhering to rocks and stones at low water-mark. It has not been previously noticed as a Scottish species, and is considered rare even in the south of England. Among our specimens there was one marked with dark stripes, arranged in a very peculiar fashion.

"4. *Locusta migratoria*, *Locust*. I have a specimen taken at Beal, North Durham, by Mr W. Willoby, about the middle of August 1834; and another taken at Scremerston on the 17th of September. A third was captured at Chirnside, where, as Mr Henderson told me, at least one other individual was seen about the same time.

"5. *Oiceoptoma dispar*. Of this rare insect I took a specimen on the heights near Smailholm Tower, in our excursion there in July 1834.

"6. *Chrysomela lamina*. I have a specimen which was taken on the Castle-hills at Berwick.

"7. *Vanessa Io*, *Peacock Butterfly*. Taken near Redheugh and the Pease Bridge, by Mr Ralph Johnston.

"8. *Melitæa Selene*. Captured near Dunse."

and from the diversity and beauty of the scenery, each member had sufficient scope to follow the bent of his inclination in the pursuit of his favourite study. The first paper read was one on the parr (the *Salmo samulus* of Willughby and Ray), by Sir W. Jardine, being the second of a series on the fishes of the Tweed. 2ndly, A notice of the fishes found in the Tweed, &c., and in the rivulets and the lochs in the vicinity of the Hirsell, by the Earl of Home. 3dly, A list of the insects captured in the neighbourhood of Berwick, by Mr C. Babington, when on a visit to Dr Johnston, was read by the Secretary; and the Reverend A. Baird brought for exhibition some beautiful specimens of *Peziza humosa* found on Bunkle-edge, and an addition to our flora. The business of the day was concluded by a brief, clear, and interesting lecture, on the best means of keeping a meteorological table, by the Reverend Mr Wallace.

The June meeting took place at Head Chesters, and whether we view the district with the eye of a naturalist, or as a mere lover of the picturesque, there is perhaps no spot we could name in preference to it. The bold and beautiful boundary of the "vast and mighty deep," so well known to geologists, the dark and deeply wooded glen of the Pease Burn, the high and scantily clothed heights above Old Cambus, furnish a variety of scenery, either taken conjointly or separately, which few districts can boast of. In the walk between the Siccar Point and the mouth of the Pease Burn, the *Astragalus glycyphyllus* was observed in several places by that acute botanist Dr Greville, whose presence added not a little to the pleasures of the day. A species of *Hieracium*, which remains to be determined, was observed in several places, and in great profusion. After the walk, Mr Selby and Dr Johnston laid before the meeting lists of the insects taken by them at Allanton. A beautiful figure of the singular animal *Cuvieria Phantapus* (Flem.) was shewn by the Secretary; it was sent from Eyemouth by the Reverend Mr Turnbull, and is the first instance of its occurrence on the coast of Berwickshire. Mr Selby mentioned a striking and beautiful display of instinct which had come under his notice, as shewn by a pair of water-hens in the removal of their eggs from their nest, which had been invaded by the rise of a water-course, on the margin of which they had built. In the contemplation of this instance of instinct, we may trace the same Great Cause, which pervades all nature; and to those who look upon the followers of natural history as weak and foolish, we might use the admonition given by him of old—Go, consider, and be wise.

The next meeting at Earlstoun presented many attractions, not having been visited previously by any member of the Club. The day being windy, was not favourable for the capturing of insects, consequently few species were taken. Included in the walk were the grounds of the far-famed "Cowden Knowes," and the Banks of the Leader: in such a spot the botanist would naturally expect to find many a favourite

flower; nor will he find himself disappointed. Amongst those observed on that day were, *Veronica montana*, *Vicia sylvatica*, *Stellaria nemorum*, *Hypericum hirsutum*, *Euonymus europæus*, *Viburnum opulus*, *Rubus saxatilis*, *Circea lutetiana*, *Hieracium prenanthoides*, *Campanula latifolia*, *Melica uniflora*, *Bromus asper*, *Carex sylvatica*, *Aspidium lobatum*;¹ and *Verbascum Thapsus* was gathered by Sir W. Jardine, but too near the cultivated grounds of the mansion not to leave some doubt as to its being indigenous. Lists of the insects taken at last meeting were read by Dr Johnston and Mr Selby. An interesting addition to the Phenogamous plants was communicated by Dr Johnston, the *Orobus sylvaticus*, which he had found in Howpark Dene, in the parish of Coldingham,² along with *Pyrola media*. 3dly, Observations on the strata of Berwickshire and North Durham, by Dr R. D. Thomson. 4thly, A paper on the Skeleton of a Red Deer found at Cheswick; and another upon the opening of a Cairn at the same place, in which were found the remains of a human skeleton, and some ancient weapons, by Mr Donaldson, concluded the business of the day.

In this brief review of the labours of the past year, the increase to our knowledge in the various departments of our pursuits will be found to be neither little nor uninteresting. Those members who have hitherto laboured so zealously, I hope will still continue their exertions; and I trust that each and all will strive to add their mite, to make our knowledge as perfect as possible. As the mighty torrent owes its power and grandeur to the tributary streams, by which in its course it is fed, so the general stock of human knowledge and happiness is increased by the efforts of each individual member of society. The progress of Natural History of late years has been rapid and extensive. Clubs similar to our own are springing up in various parts of the kingdom; and its natural history will never be fully investigated, until each county can boast of one. When we consider what we have already done, and what still remains to do, even in this county, the productions of which are better known, I believe, than those of any other in the kingdom, we can easily imagine what a field of discovery in every branch is yet unexplored; and when we shall have attained to a complete enumeration of the species of each class, what a boundless and inexhaustible mine for wonder and admiration still remains, in the investigation of their habits and uses in the different places assigned them in the creation. To rest satisfied with the mere knowledge of the name of an animal or plant, is to stop on the very threshold of Nature's wide domain. The true naturalist seeks to discover the great laws of Nature: their contemplation leads him to admire and adore the wisdom and power of Him who has given them

¹ All these were gathered in Redpath Dean.

² Found also by the Rev. A. Baird, on a wooded bank between Penmanshiel Wood and Bank-house.

bounds they cannot pass, in their reproduction, preservation, and annihilation. He investigates their harmonious connexion, their wonderful organization and powers, their uses, as they conduce to supply his wants, relieve his cares, assuage his disease, embellish his life, or add to his happiness. In their pursuit he finds health, contentment, and peace. To him, the fertile vale, the barren heath, the cloud-capped hills, and the dry and arid rock, furnish objects for his study and delight; and with a mind influenced by such feelings, he is ready to exclaim,

“These are thy works, O God, and they proclaim thy praise.”

List of Members, continued from p. 33.

J. S. Donaldson, Esq. of Cheswick, . . .	May 6. 1835.
Rev. M. Dods, Belford,	_____
Rev. W. B. Cunningham of Prestonpans, .	_____
Sir David Erskine of Dryburgh, . . .	Sept. 16.---

Description of NATICA HELICOIDES, a new British Shell. By Dr
GEORGE JOHNSTON.

Natica helicoides.

Shell ovato-conical, smooth, white, immaculate, covered with a yellowish epidermis; whorls 5, rounded, separated by a channelled suture, the spire produced and rather obtuse; aperture pure white, with a small fissure on the pillar. Length $\frac{6}{10}$ ths; breadth scarcely $\frac{4}{10}$ ths.

Hab. Berwick Bay.

Obs. This new species was found in the refuse of a fishing-boat. When the epidermis is removed, the whorls appear to be finely striolate in a spiral direction. Animal unknown.

List of the Malacostraca Podophthalma, found on the coasts of Berwickshire and North Durham. By R. EMBLETON, Surgeon.

1. CARCINUS *Menas*, Leach, Mal. Brit. tab. 5. Common dog crab. Penn. Brit. Zool. iv. tab. 2, fig. 5. Everywhere common.
2. PORTUNUS *puber*, Leach, Mal. Brit. tab. 6. Velvet crab. Penn. Brit. Zool. iv. tab. 4, fig. 8. Not uncommon.

3. *PORTUNUS corrugatus*, *Leach*, Mal. Brit. tab. 7, figs. 1-2. Wrinkled crab. *Penn.* Brit. Zool. iv. tab. 5, fig. 9. Berwick Bay, rare. Dr Johnston.
4. *PORTUNUS plicatus*, *Milne Edwards'* Hist. des Crust. part 1, p. 442. *Penn.* Brit. Zool. iv. tab. 4, fig. 6, a. Occasionally brought from deep water in Embleton Bay, adhering to the nets of the fishermen.
5. *PORTUNUS marmoreus*, *Leach*, Mal. Brit. tab. 8. Marble crab. *Penn.* Brit. Zool. iv. pl. 2, fig. 6. Occasionally met with in the same way as the preceding.
6. *CANCER pagurus*, *Leach*, Mal. Brit. tab. 10. Common crab. *Penn.* Brit. Zool. pl. 3, fig. 7. This is the only species used as food on these coasts; it is taken in vast quantities, and during the whole year.
7. *PINNOTHERES pisum*, *Leach*, Mal. Brit. tab. 14. Pea crab. *Penn.* Brit. Zool. iv. pl. 1, fig. 1. Inhabits bivalve shells, chiefly those of the common mussel. I have taken it also from the *Cardium laxigatum*, the only specimen of the shell that has occurred to me. It is by no means uncommon in the mussels obtained at Holy Island, but all are females.
8. *PINNOTHERES Cranchii*, *Leach*, Mal. Brit. tab. 14, figs. 4-5. A single specimen has only come under our notice; it was brought from Eyemouth by the Rev. Mr Turnbull.
9. *MACROPODIA phalangium*, *Leach*, Mal. Brit. tab. 23, fig. 6. Slender-legged crab. *Penn.* Brit. Zool. iv. pl. 9, fig. 17. Common.
10. *MACROPODIA tenuirostris*, *Leach*, Mal. Brit. tab. 14. This is of much less frequent occurrence than the preceding; it is easily distinguished from it by the length of the rostrum, and by the spines on the inner side of the claws.
11. *LITHODES Maja*, *Leach*, Mal. Brit. tab. 24. *Penn.* Brit. Zool. iv. pl. 8, fig. 14. This beautiful crab is not uncommon in Embleton Bay. The male is at once distinguished by the length of the claws and size of the spines; the females, however, are much more numerous, not above one male occurring in five or six. They are called *Harpers* by the fishers.
12. *EBALIA Pennantii*, *Leach*, Mal. Brit. tab. 25, figs. 1-6. Uneven crab. *Penn.* Brit. Zool. iv. pl. 9, A, fig. 19. Rare. A single specimen, taken at Redheugh, Berwickshire, in the collection of Dr Johnston, and another in my own, taken in Embleton Bay, are the only ones that have come under my notice. In both, which are females, the abdominal covering is marked with two rows of bright scarlet spots, a character not noticed by Dr Leach.
13. *HYAS araneus*, *Leach*, Mal. Brit. tab. 21, A. Spider crab. *Penn.* Brit. Zool. iv. pl. 9, fig. 16. Common. Generally covered with fuci and corallines.
14. *HYAS coarctatus*, *Leach*, Mal. Brit. tab. 21, B. Berwick Bay. Dr Johnston.

15. *INACHUS Dorynchus*, Leach, Mal. Brit. tab. 22. Berwick and Embleton Bays. Not unfrequent.
16. *PORCELANA platycheles*, Milne Edwards, Hist. des Crust. pl. 22, fig. 5. Great-clawed crab. Penn. Brit. Zool. iv. pl. 6, fig. 12. Very common in Berwick Bay, but more rare to the south.
17. *PORCELANA longicornis*, Lamarck, Anim. s. Vert. v. 230. Long-horned crab. Penn. Brit. Zool. iv. pl. 1, fig. 3. A beautiful species, found frequently in the roots of the *Fucus palmatus*.
18. *PAGURUS Streblonyx*, Leach, Mal. Brit. tab. 26. Hermit crab. Penn. Brit. Zool. iv. pl. 17, fig. 38. Very common, occupying shells of the genus *Turbo* and *Murex*.
19. *GALATHEA squamifera*, Leach, Mal. Brit. tab. 28, A. Berwick and Embleton Bays. Not common.
20. *GALATHEA spinigera*, Leach, Mal. Brit. tab. 28, B. Penn. Brit. Zool. pl. 14, fig. 26. A common but beautifully marked species.
21. *GALATHEA rugosa*, Leach, Mal. Brit. tab. 29. Penn. Brit. Zool. iv. pl. 13, fig. 25. Not uncommon; differs from either of the preceding in the extreme length of the first pair of claws.
22. *GALATHEA nexa*, nova species. Three specimens of this hitherto unnoticed species have only yet been found, two in Berwick Bay, and the other in Embleton Bay. It forms a beautiful link between *G. squamifera* and *G. spinigera*, approaching to the first in the shape of the body, and to the latter in the shape and size of the claws. The characters of the three species may be thus expressed:
 - (1.) *Gal. spinigera*. Arms rather small, flattened, hirsute, very spinous; the spines arranged along each margin, and a row of lesser ones down the middle; ligament of the marbled shell bright blue.
 - (2.) *Gal. nexa*. Arms large, hirsute; the hand without spines, the wrist with a single one on the inner side, or, when two, the anterior is much the smallest; ligament of the shell brown (Plate I).
 - (3.) *Gal. squamifera*. Arms large, almost naked; the hand without spines; two unequal spines on the inner side of the wrist; the posterior spine one-half less than the anterior; ligament of the shell blackish.
23. *NEPHROPS norvegicus*, Leach, Mal. Brit. tab. 36. Norway Lobster. Penn. Brit. Zool. iv. pl. 12, fig. 24. One of the most beautiful of the Crustacea; on the coast of Berwickshire, opposite to Coldbrandspath, it is not uncommon, but is rarely seen farther south. To the Rev. A. Baird of Coldbrandspath, I am indebted for the specimen I possess.
24. *CRANGON vulgaris*, Leach, Mal. Brit. tab. 37, B. Common Shrimp. Penn. Brit. Zool. iv. pl. 15, fig. 30. On all our sandy bays.

25. *PANDALUS annulicornis*, *Leach*, Mal. Brit. tab. 40. Red Shrimp of the fishermen. Berwick Bay, &c. not uncommon. Remarkable for its bright red colour; the antennæ, which are very long, marked with alternate red and white bands.
26. *PALÆMON Squilla*, *Leach*, Mal. Brit. tab. 43, figs. 11-13. In pools in the Bay on the north-east side of Holy Island, &c. Frequent on the coast of Berwickshire.
27. *ASTACUS Gammarus*, the Lobster, *Penn.* Brit. Zool. iv. pl. 10, fig. 21. Taken in great numbers on this coast. The regular time for commencing to take them for the London Market is the 1st of December. A full-grown lobster, to use the language of the fishers, must measure four inches and a half in the length of the barrel; they then bring from ten to fourteen shillings a-score; if below that size, they bring only half price. Of late years, the numbers taken annually have very much decreased, owing to the increase of the fishery.
28. *ASTACUS fluvialis*, the Crawfish, *Penn.* Brit. Zool. pl. 15, fig. 27. In the rivulets to the south of Berwick Bay, this species is not uncommon. Dr Johnston, however, has not met with it in Berwickshire.

Contributions to the Flora of Berwickshire.

1. ADDITIONAL SPECIES.

- SPHAGNUM squarrosum*. In peat bogs on Coldingham Moor. Dr Johnston.
- PELTIDEA aphthosa*. On rocks west from Longformacus Manse, sparingly, Mr Thomas Brown.
- AGARICUS fragrans*, *With. Bot. Arrang.* iv. 161. Anton's-hill and Hirsæl Woods, in October and November, not uncommon, Miss E. Bell.
- AGARICUS roseus*, *With. Bot. Arrang.* iv. 258. Hirsæl Woods, Miss Hunter and Miss E. Bell.
- CANTHARELLUS levis*, *Bot. Gall.* ii. 797. Parasitical on *Hypnum rutabulum*, Miss Hunter. *Description.* Fungus sessile, of a uniform white colour, thin and membranous, cupped, the disk somewhat uneven, the margin entire, even or sinuous; hymenium not veined, roughish. The largest specimens are fully three-tenths in diameter. When old, the disk becomes often nearly plane. On drying, the plant shrivels up, so that it can scarcely be recognised, but its original appearance is restored by immersion in water.
- DÆDALEA confragosa*, *Bot. Gall.* ii. 795. *Boletus labyrinthiformis*, *With.*

- Bot. Arrang.* iv. 329. On the decaying roots of trees at the Hirscl, Miss Hunter and Miss E. Bell.
- MERULIUS *lachrymans*, *Grev. Fl. Edin.* 397. On much decayed fir sticks from the Hirscl Woods, Miss Hunter and Miss E. Bell.
- PEZIZA *hemispherica*, *Bot. Gall.* ii. 744. *P. hispida*, *With. Bot. Arrang.* iv. 354. Anton's-hill Woods, Miss Hunter.
- PEZIZA *sarcoides*, *Grev. Fl. Edin.* 423. Hirscl Woods, Miss E. Bell and Miss Hunter.
- POLYPORUS *betulinus*, *Grev. Fl. Edin.* 400. On the trunk of a decaying birch tree near Anton's-hill, Miss Hunter.

2. ADDITIONAL HABITATS.

- HIERACIUM *Prenanthoides*. Banks of the Dye at Longformacus; Pease Bridge Dean, Mr Thomas Brown.
- HIERACIUM *umbellatum*. Near Woodend, in the parish of Langton, Mr Thomas Brown.
- PTERIS *crispa*. On the Black-hill at Earlstou, plentiful.
- AGARICUS *flabelliformis*, *A. ficoides*, *With. Bot. Arrang.* iv. 303. On decaying sticks at the Hirscl, Miss E. Bell and Miss Hunter.
- HELVELLA *mitra*. Anton's-hill and the Hirscl Woods, not uncommon, Miss Hunter and Miss E. Bell.
- PEZIZA *macropus*. Hirscl Woods, Miss E. Bell and Miss Hunter.
- PEZIZA *ochroleuca*. Hirscl Woods, Miss Bell and Miss Hunter.
- PEZIZA *umbrina*. Anton's-hill woods, common, Miss Hunter.
- POLYPORUS *varius*. On decayed sticks from the Hirscl Woods, plentiful. Miss Hunter and Miss E. Bell.

3. ERRATUM.

For RHAMNUS CATHARTICUS, page 56, read HIPPOPHAE RHAMNOIDES.

Remarks on the Mode of Formation of certain curiously shaped Stones, found in the bed of a small stream near Melrose, and popularly known in the neighbourhood by the name of the "Fairy Stones." By the Rev. A. BAIRD.

THOSE of us who remember with anything like correctness some of the earlier of those interesting productions known throughout the civilized world by the title of "The Waverley Novels," will have little difficulty probably in recalling to their recollection the scenery of "The Monastery." They will recollect the beautiful descriptions which there occur of "St Mary's ruined pile,"—of the smiling scenery of fair Tweedside,—of the ancient castle of the Glendinnings,—of the pool in the river where the poor Sacristan was so uncivilly and unmer-

cifully ducked by the White Lady,—and of the usual spot itself of that fair creature's residence, the pastoral Valley of Glendearg. These several scenes occur within a very few miles of each other, and in each and all of them there is an interest and charm of no common nature, whether we consider their own inherent beauties, or the many pleasing associations which either the genius of the poet's pen, or the deeds of other years, have thrown around them. Of these various scenes, however, the last is the one which at present is more immediately interesting to us, as it is the scene where not only many of the principal events of the romance are supposed to have taken place, but where also the curious substances occur which are to form the subject of our present speculations. This pleasing little valley commences about two miles westward from the town of Melrose, its general direction being from north to south, and extending in length about five miles. It is watered by a limpid little mountain stream, named the Elwand or Allan Water, which, after forming some very pleasing scenes, discharges itself into the Tweed on its northern bank, and near the site of the ancient bridge across that river. Towards the south, the valley thus opens into the wider vale of the Tweed, while at its northern extremity is situated the ruin of Hillslop Tower, the undoubted Glendearg of the romance.

There are several ways of access to this valley leading from different directions, but to see and to examine its scenery to the greatest advantage, the most interesting, although certainly not the shortest, is by the streamlet's side, along a winding path through Langlee-wood, the property of Lord Sommerville. During this part of the walk the scenery is very pleasing, although much contracted; but on leaving it a wider glen gradually opens to view, bounded on one side by a precipitous bank or scaur of a reddish colour, varied here and there by a few intermingled patches of green sward, and on the other by a series of more gently swelling eminences, forming, from their more cultivated appearance, a striking contrast to those opposite to them. Proceeding onwards this kind of scenery continues for some time with little interruption, till we arrive at a scene somewhat different, an amphitheatre of scaurs and precipices thickly strewn with copsewood, at the foot of which the streamlet is seen working its troubled way. This spot is generally known by the name of the "Fairy" or "Nameless Dean," and it is in this part of the valley, as the name itself suggests, that the "Fairy Stones," as they are vulgarly called, are most frequently found. These are of various sizes, from that of a bean to two or sometimes three inches in circumference, and of a great variety of shapes, some exhibiting the exact appearance of hunting-caps, some of tea-pots, kettles, buttons, walnuts, &c., &c. Generally speaking, however, their usual form is roundish, with a flattened base; and they are all seemingly composed of a pretty pure clay, which yields more or less readily to the knife. They are almost invariably found by

collectors in the bed of the stream, and from their singular shapes and equivocal sort of origin, have most probably given the name of the "Fairy Dean" to the little valley in which they are usually found. These stones are well known to the inhabitants of the neighbourhood, and seem to be regarded by many with no small veneration. Well known, however, though they are, I have not been able, except in one trifling book, to meet with a single notice or remark upon the subject. This book I do not now remember the title of, but its object, as far as I can at present recollect, is to serve as a guide to strangers visiting the neighbourhood of Melrose and Abbotsford. In this little work, the author sums up both his description of the external appearance of these stones, and his opinion of their origin, in two short lines. "Here occur," says he, "some curiously shaped stones, which are said to be found after great falls of rain;" "and which are justly supposed," as he adds in a note, "to be the petrifications of some mineral spring hard by." Whether this *supposition* was the author's own invention or not, or whether, along with his own, he expressed the opinion of any other observers, I know not; but I fear the explanation which he offers, will hardly satisfy those who examine these substances even with the most common attention. They evidently bear no earthly similitude to a "petrification" (if that word at least is to be understood in its proper meaning), and I know of no "mineral spring hard by" possessing any such qualification as that alleged. This idea, therefore, appearing so unsatisfactory, it will be necessary to have recourse to some other explanation; and accordingly, on talking over the subject with some acquaintances, I have heard two other opinions upon the subject, which I shall next very shortly notice. The one is, that they may have been originally portions of a soft clay rock, occurring somewhere towards the head of the glen, which, having been detached from their native situation by the action of the stream or weather, had gradually been worn into their present fantastic shapes by simple attrition in the channel of the rivulet: and the other, which, before visiting the scene personally, I was inclined to think sufficiently satisfactory, is, that they may have been originally imbedded portions or nodules *contained* in an amygdaloidal rock, that is to say, nodules of fine clay, which, by infiltration from above, had gradually found their way into the cavities with which that kind of rock abounds, and which, partly by the influence of the weather, and partly by the occasional violence of the water, had been forcibly disengaged, and carried down into the bed of the stream where we now find them. Neither of these opinions do I now consider as correct; for, with regard to the former supposition, if they were merely portions of a clay rock, formed into their present shapes by simple attrition and the unceasing flow of the waters over them, why, it might be asked, do we not find such stones in every similar situation where clay rocks occur? and why should the Allan Water manufacture such

curiosities, and no other water? But, besides this, the great variety in the shape of the stones themselves, is a strong objection against this supposition. For, were they formed merely by friction, we should expect of course that they would all uniformly assume the circular form; and that, instead of finding one perfectly flat on one side and roundish on the other, and instead of the sharp angles and projecting lines we observe in others, as beautifully marked as if they had been turned by art, we should find them of one uniform indistinct roundness, and certainly without the beautiful character of the projecting lines already alluded to. And with regard to the second supposition, it may be sufficient to state that no amygdaloidal rocks appear to occur in all this neighbourhood, nor any other rock in which nodules of this description could be imbedded. The rocks, where visible, appear in general to be stratified, the fundamental ones at least being greywacke and greywacke slate. The other rocks I cannot take upon me at this moment to name (unless to suspect that there may be slight traces of the old red sandstone), for the only regular visit I ever paid to the glen was a hurried one, and that too when the shades of evening were beginning rapidly to close around me. Dim and indistinct, however, though the surrounding objects were now becoming, enough of light was still left to guide me to another theory upon the subject, which possesses the merit at least of being a simple one. I imagine, then, that these stones are in fact little else than a peculiar kind of stalactite, and, generally speaking, formed in much the same way, although their component parts are somewhat different from ordinary stalactites. On several parts, accordingly, of the banks of this dean there flow little trickling streams of water, and in one place the bank is composed entirely of a stiff tenacious alluvial clay, with boulders of different rocks and of various sizes firmly fixed in it, and frequently projecting considerably beyond the surface of the clay of which the bank is composed—(a specimen of this kind I at one time had, but cannot now exhibit it, which I am sorry for). Down this slope water is continually trickling, highly saturated, as we may suppose, with the particles of the fine clay, which, as it flows, it of course deposits either in small hollows on the surface of these boulders, or round any little inequality or obstruction on their surface to which it can attach itself. Thus, for example, in any rolled mass, such as that now before me, we can easily suppose that there may be many little inequalities either higher or lower than its general surface,—that water regularly trickling over this, highly saturated with the particles of a fine and tenacious clay, meeting with these inequalities and obstructions, would find something on which, or around which, to form a deposition,—that a nucleus would thus be formed, and that, as the water kept trickling, layer after layer would be gradually added, until at length the deposition would increase into the form and size which these stones generally assume. Such I am inclined to consider as the general mode of for-

mation of these curious substances; and this being admitted, the various peculiarities of figure observable in them may easily be accounted for. Those, for instance, with a protuberance to one side more than another, would be deposited on the surface of the boulder inclined at a considerable angle; those again with the most perfect shapes, would be formed on the under side of the stone in a vertical position, like a regular stalactite; and so we might equally easily explain any variety of figure in those specimens which have a flattened base, and which thus shew that they must at one time have adhered to a level surface. Those again which have an oval shape, composed as it were of two distinct hemispheres, we may suppose to have been formed in this manner, viz., by the water flowing over a hollow on the surface of the mass or boulder, that this hollow will gradually be filled by the particles of the fine clay, which, as they will naturally have more attraction for themselves than the smooth surface of the rock or stone they are deposited on, will thus go on increasing, layer after layer being added, until at length the figure of an oval or double hemisphere is assumed.

It is easy likewise to explain how they occur so often single, and are generally found in the bed of the streamlet. A very violent shower of rain would account satisfactorily for both appearances. The violence of the water flowing over the banks would loosen many of the imbedded boulders,—they would rush furiously down the slope,—from the roughness and resistance of their course they would part with their attached fairy stones: these would thus be carried into the bed of the stream, where, as before remarked, they are generally found, and that too in greatest abundance after violent showers of rain.

It has been remarked by the inhabitants of the neighbourhood, that they are much less abundant now than they once were, at least good specimens; but whether this be owing to their having been more sought for of late years by the increased number of visitors to this valley, or whether it is owing to the higher grounds above the Dean being more drained than formerly, and consequently allowing less water to trickle down their slope, I shall not pretend to determine.

A Catalogue of the Bivalved Shells found on the Coast of Berwickshire and North Durham. By Dr JOHNSTON.

SUBKINGDOM MOLLUSCA. CLASS CONCHIFERA.

I. MONOMYAIRIA.

OSTREADÆ.

Anomia ehippium.
squamula.

Anomia punctata.
aculeata.
Ostrea edulis.

PECTENIDÆ.

Pecten maximus.
opercularis.
lineatus.
varius.

Pecten obsoletus.

spinosus, Brown, Illus. pl. 33,
fig. 8.
Lima fragilis.

II. DIMYAIRIA.

ARCAIDÆ.

Arca fusca.
Nucula nuclea.
minuta.

Tellina fabula.

tenuis.
crassa.

Psammobia florida.

Ferroensis.
solidula.

MYTILIDÆ.

Mytilus edulis.
var. pellucidus.
var. subsaxatilis, Williamson, in
Mag. Nat. Hist. vii. p. 354,
fig. 48.
Modiola vulgaris.¹
var. barbatus.
discors.
discrepans.²

Cyprina islandica.⁴

Mactra solida.
truncata.
subtruncata.
elliptica, Brown, Illus. pl. 15,
fig. 6.
stultorum.

Kellia suborbicularis.⁵
rubra.

Cyclas corneus.⁶
amnicus.

UNIONIDÆ.

Anodon anatinus.
cygneus.

Pisidium pulchellum, Jenyns.
pusillum, Jenyns.

Astarte Danmonikæ.
Scotica.

CONCHACEÆ.

Cardium edule.
echinatum.³
lævigatum.
Donax trunculus.

compressa.
Cytherea exoleta.⁷
lincta.
ovata.

¹ Lamarck has arranged "*Modiola*" amongst the "*Monomyairia*," but *M. vulgaris* has three, or more properly four, adductor muscles: viz., one near each end of the shell, and two lesser ones towards the centre of the body.

² The foot of this and the preceding is very extensible, and when extended is several times longer than the shell, and almost filiform. By fixing this foot at the furthest point to which it can be stretched, and then dragging the shell forwards, the animal moves with considerable rapidity; and swims readily in a reversed position on the surface.

³ Foot of a rich pink colour, long, somewhat compressed, with a bend or elbow, whence it tapers to an obtuse point: cloak with a plain thin margin, about a line in breadth, behind which it is suddenly thickened, and at regular intervals raised into glandulous warts or tubercles, corresponding to the grooves in the shell; respiratory and excrementitious apertures encircled with tentacular filaments; labial appendages long, strongly striate on one side.

⁴ Animal white; the cloak open, with a thickened minutely crenulate border, the orifices of the passages encircled with papillæ; foot broad, compressed, the margin plain, and somewhat undulate.

⁵ Animal clear white; syphonal tube single, cylindrical, with a plain aperture; foot compressed, tapered, thin, and flexible.

⁶ Often found in marl.

⁷ Animal with a broad compressed foot; syphonal tubes united throughout, with plain apertures.

<i>Venus cassina.</i>	<i>Mya arenaria.</i>
<i>fasciata.</i>	<i>norvegica.</i> <i>Lyonsia striata</i> , Tur-
<i>Gallina.</i>	<i>ton.</i>
<i>undata.</i>	<i>Sphenia Swainsonii.</i>
<i>Venerupis perforans.</i>	<i>Anatina pubescens</i> , <i>Turton.</i> <i>Amphi-</i>
<i>pullastra.</i>	<i>desma pubescens</i> , <i>Fleming.</i>
<i>decussata.</i>	<i>Amphidesma album.</i>
<i>virginea.</i>	<i>Solen siliqua.</i>
	<i>ensis.</i>
	<i>pellucidus.</i>
	<i>Hiatella rugosa.</i> ¹
	<i>arctica.</i>

PYLORIDÆ.

Corbula striata.
Lutraria vulgaris.
Mya truncata.

The following species I have not met with :—

Pecten sinuosus. Holy Island, *Winch.*
Mytilus edulis, var. *incurvatus.* Holy Island, *Winch.*
Isocardia Cor. "This exceeding rare shell in the British catalogue was taken by me alive in the Firth, near St Abb's Head."—*Laskey in Wern. Mem.* i. 385.
Cardium rubrum. Holy Island, *W. C. Trevelyan, Esq.*
Amphidesma convexum, *Fleming.* *Mya declivis*, *Dillwyn.* Holy Island, *Winch.*
Cytherea Guineensis. "Taken in deep water, off St Abb's Head, very rare. One specimen was taken alive."—*Laskey.*
Venus subrhomboidea. Taken by *Captain Laskey*, off St Abb's Head, in deep water, very rare.
Pholas Dactylus. Holy Island, *Winch.*
 crispata. Holy Island, *Winch.*
Solen Legumen. Holy Island, *Winch.*

In the preceding list I have followed the nomenclature of Dr Fleming's "British Animals," except where the contrary is specified. Of the species in italics, the empty shells only have been found, but the others have occurred in a living or fresh condition. Few of them seem to be abundant in our bay, but their apparent scarcity may be owing to the want of proper means and opportunities of ascertaining their localities, for the dredge has not been used, my specimens having been picked from the refuse of fishing-boats, or on the shore after storms. The *Pecten lineatus*, *P. spinosus*, *Lima fragilis*, *Area fusca*, *Kellia rubra*, *Anatina pubescens*, *Tellina crassa*, *Psammobia florida*, *Astarte compressa*, and *Mya norvegica*, are, however, considered among our rarest species by collectors in general, and in that respect are the most interesting in the catalogue.

The Mussel (*Mytilus edulis*) is our most plentiful species, and at certain seasons is brought to the market, many people being fond of them when roasted or pickled; and it is also occasionally used as a bait by

¹ Animal with two large syphonal tubes, united throughout; a small byssus towards the anterior end.

our fishermen. On the rocky and exposed coast of Berwickshire it rarely attains a size exceeding one inch, but becomes very large and fine in the gravelly and sandy bays which lie opposite Holy Island, where it finds a supply of brackish water. The Cockle¹ (*Cardium edule*) is gregarious in the same places, whence large quantities are annually taken for sale to Berwick and the neighbouring villages. The Clams (*Pectenidæ*) are rare with us, excepting the small *obsoletus*, which is the favourite food of the flounder, from the stomach of which many specimens can generally be procured. The Solenes, or Razor-fish, and the Myæ abound on the sandy flats about Goswick and southward, burrowing in the sand and gravel, but being used neither for food nor bait, they are consequently not sought after. The only Oyster-bed is in the channel between Holy Island and the mainland, and is the private property of the Earl of Tankerville. In the inventory of the Priory of Holy Island for 1381-2, we find expended for "a sloop (navicula) bought of a certain Scotchman (de quodam skoto), with the oysters and other goods contained in it, 100s." From the nature of the purchase, Mr Raine thinks it may be inferred "that there was at that period no oysters to be procured at home;" and suggests, that the oysters of this very cargo were the founders of the present valuable colony. (*Hist. N. Durham*, p. 110.) The conjecture is, I believe, unfounded, for not many years since, the oysters being exposed, by the unusually great recess of a spring tide during the night, to a severe frost, were all killed, and the bed had to be renewed from Prestonpans; and, if my information is correct, a similar accident has occurred more than once during the last half century.

None of our bivalved shells are remarkable for their brilliancy or beauty. The fresh-water species are of a dirty green or horn colour, while the marine are generally of a uniform dull chalky-white, often covered with a brown epidermis, and sometimes marked with coloured lines and spots, but less strongly than on the same shells from the southern shores of our island, and greatly inferior to the specimens figured in our illustrated works on Conchology. The pectenæ, however, exhibit mottled and streaked surfaces of brown, yellow, and white, which is very agreeable, and hence they have been applied to many articles of fancywork; and when the outer layer of the shell of the mussel is removed with care, a fine display of blue and white bands, blending their iridescent hues, is exposed. The delicate valves of *Kellia suborbicularis* I have seen very successfully used in imitating the petals of the hawthorn.

The cloak of the pectenæ deserves attention from the beauty and

¹ "On the sands of those farms (Ross and Elwick) are very large cockles, known in the country by the name of Budle-cockles: also an oyster scarp, which has long been famed by those who profess an elegant taste, the oysters produced there being said to excel those of every other part of the kingdom."—*Hutchinson's Durham*, v. iii. p. 471.

singularity of its structure. The free margin is clouded and mottled something like the shell, with brown, orange, black, and white, and two or three series of short ciliated tentacula, which are not exactly marginal, encircle the outer edge. Similar tentacula garnish the thickened margin next the adhering part of the cloak, intermixed with a few of much larger size placed at distant intervals; and in this inner series we find little black bead-like bodies placed at regular intervals, glowing with the lustre of some precious stones. These beads are very hard, iridescent, circular, nearly sessile, and, I think, cupped in the centre; but of their function no probable conjecture has been offered.

It will be observed from the table, that no species of Tubicolæ is found on our shore,—species which are more peculiarly organized for burrowing in wood, clay, and stone; yet our limestone rocks are perforated in every direction with thimble-like cavities, large enough to admit a finger. These holes are the sole work of the *Hiatella rugosa*, which has the wonderful property of excavating its cells in the rock by the excretion probably of an acid or solvent, the nature of which, however, remains to be discovered.

Catalogue of Insects found at Berwick-upon-Tweed, in August 1834. By
CHARLES C. BABINGTON.

Dromius linearis. ¹	Hydroporus alpinus. ⁶
—— fasciatus. ¹	—— sexpustulatus.
Helobia Gyllenhalii. ²	—— proximus.
—— brevicollis. ²	—— ovalis.
Amara lævis.	—— jugularis.
Bradytus apicarius.	—— erythrocephalus.
Calathus mollis. ³	—— flavipes.
Argutor erythropus.	—— pubescens.
Trechus minutus.	Colymbetes maculatus.
Aepus fulvescens. ⁴	—— bipustulatus.
Peryphus agilis.	Gyrinus natator.
Bembidium paludosum. ⁵	Enicocerus viridiæneus.
Notiophilus striatus.	—— tristis.
Haliphus obliquus.	—— Gibsoni.
—— ruficollis.	Elmis Volkmæri.
Hygrotus scitulus.	—— variabilis.
Hydroporus depressus.	—— lacustris.
—— 12-punctatus.	—— rugosus.

¹ Found on plants by the side of the river at Berwick, but not in plenty.

² These two insects occur in great plenty under stones by the sea-shore.

³ In plenty under stones by the sea.

⁴ Taken in the crevices of rocks near to high-water mark, by Dr George Johnston.

⁵ Taken by Mr Ralph Johnston on the sides of the Whiteadder, at Claribad Mill.

⁶ In the Whiteadder river.

Elmis æneus.¹
Phalacrus coruscus.²
Cryptophagus cellaris.
Byrrhus pilula.
Necrobia ruficollis.
Anthonomus fasciatus.
Notaris acridulus.
Hypera punctata.
 ——— *nigrirostris*.
Otiorhynchus piceus.
Apion æneum.
 ——— *radiolus*.
 ——— *subsulcatum*.
Adimonia halensis.

Sphæroderma Cardui.
 ——— *testacea*.
Haltica nemorum.
Phaedon tumidulus.
Chrysomela fastuosa.
Cassida rubiginosa.
Coccinella dispar.
 ——— *globosa*.
 ——— *variabilis*.
 ——— *11-punctata*.
Rhyzobius litura.
Charæas graminis.
Pedicea rivosa.

Notice of the Parr. By Sir WILLIAM JARDINE, Bart.

THE fishes inhabiting the rivers of Berwickshire are comparatively limited in the numbers of their species, but some of them are of much importance and value, while others, as the little fish we are now about to notice, although abundant, and familiarly known as a *parr*, has yet some unravell'd mysteries in its history, and there are, I believe, only a few persons at the present time, who are able to say what it really is, or to point out the distinctions which separate it from its congeners. Among naturalists generally, an uncertainty seems to have existed whether this fish was the young of some of the migrating salmon; but more lately, this opinion seems to have resolved itself into this, whether the *parr* was a species, or only the young or a variety of the common river trout. The following observations are the result of comparisons made last month between Tweed specimens of the *parr* and *S. Fario*. We shall first, however, shortly notice the habits of the former.

Among the British Salmonidæ, there is no fish where the habits are so regular, or the colours and markings so constant. It delights in the clearest streams, with rocky or gravelly bottoms, and seems pretty generally distributed in Britain in those which have this character; but is not at all found in the low and flat districts, where the waters are deep and sluggish. It frequents the shallower fords, or the heads and lower parts of streams, in shoals, hanging nearly in one place, and in constant activity from the exertion, apparently day and night. It takes any bait with the greatest freedom at all times, and when no trout, though abundant among them, will rise or bite. That part of its history which is yet unknown is its breeding. Males are frequently found so far advanced, as to have the milt flow upon being handled; but at the same period, the females had the roe in a very backward

¹ The species of *Enicocerus* and *Elmis* were found in plenty under stones in the bed of the Whiteadder, particularly just below the bridge nearest to Berwick.

² Under bark.

state. Neither have they been seen in an advanced state at any other season, or discovered spawning upon the shallower streams, like the common trout. It is probable that this little fish may also be found in some of the continental alpine and subalpine streams, but I cannot say so from observation. In the north of Europe I suspect it is wanting; and in our late excursion to Sutherland, a perceptible decrease of its numbers was observed towards the north. It should also be observed, that I have never seen the *parr*, or been able to find any traces of it, except in rivers which had an uninterrupted intercourse with the sea. The size is from *three* to *six* inches in length; very rarely specimens reach eight and nearly nine inches. It abounds in nearly all the Berwickshire rivers.

The general colour on the upper parts is a greenish-grey, changing to a pure silvery white on the lower parts, which, however, are sometimes tinted with yellow. When the streams which they frequent are impregnated with moss from some of the small alpine sources, upon each side is a row of oval-shaped marks of a deeper tint, and more inclining to bluish-grey than that of the upper parts; and it is probable that from a somewhat similar marking being seen in the young of the common trout, and the young of several other Salmonidæ, the supposition of this being identical with some of them was first surmised. In the *parr* these markings are narrower and more lengthened in their form. The general smaller spotting of the sides seldom extends below the lateral line, and upon the gill-cover there are almost always two black spots; sometimes one is only distinctly marked, but a trace of the other is mostly perceptible, and the relative position of them is almost always alike. In comparison with a trout of similar size, the *parr* is altogether more delicately formed; the nose is blunter; the tail more forked; but the chief external distinction is in the great comparative power of the pectoral fins, which are longer, much more muscular, and nearly one-third broader; and we shall at once see the necessity of this greater power, when we consider that they serve to assist in almost *constantly suspending* this little fish in the most rapid streams. Scales of the *parr*, taken from the lateral line, were altogether larger, the length greater by one-third; the furrowing more delicate, and the form of the canal not so apparent or so strongly marked towards the basal end. In the osteology of the head, which appears to offer the most constant and well-marked distinctions in this tribe, the general delicacy (still continuing the comparison with a trout of same size) of the bones is in all parts kept up. The *opercle*, forming the posterior edge of the gill-covers, is much more rounded, approaching, in this respect, to the form of it in the salmon; in the trout, the lower corner is decidedly angular. The *inter opercle* is longer and narrower. The *maxillary bone* is much shorter, but broader at the posterior end, whence the much shorter or less gape in the *parr*. The *vomer* is much weaker. The bones of the rays of the gill-covers are

longer and much narrower. The tongue is longer, weaker, and not so broad. The under jaw much weaker, and the distance between its rami one-third less. The *teething* much more delicate.

These are the principal distinctions which appear in the external form and osteology of the head. In the latter every bone differs, and the differences appear constant in all that I have taken to pieces; and in this state, therefore, I have no hesitation in considering the *parr* perfectly distinct from any species or variety of trout we are acquainted with, and entitled to hold a separate rank in our fauna. From the *Migratory Salmon* it is separated entirely by its habits; and I consider that it should therefore stand in our systems as the *Salmo Salmulus* of Willughby and Ray. The correct distinguishing marks to be seen by a person who has not leisure to make a minute examination, are the great size of the pectoral fins, the shortness of the maxillary bones, and consequent small gape, and the narrow breadth between the rami of the lower jaw.

On the Instinct of the Water-Hen. By P. J. SELBY, Esq.

As the following anecdote seems to indicate a degree of intellect, or an exercise of the reasoning power, in the feathered race, and apparently acting in conjunction with *Instinct*, or that blind impulse to perform certain offices or actions, for which the lower orders are remarkable, and which, according to the views of one of our ablest naturalists, is supposed, and with great probability, to be the result of physical action upon organizations adapted to receive and respond to it, I think it may not be altogether uninteresting to the Club, and may possibly direct the attention of some of its members more immediately to the various phenomena exhibited by the lower animals in regard to their instincts, combined, or acting as it were, at times in conjunction with the exercise of their reasoning or intellectual faculties. During the early part of the past summer, a pair of water-hens (*Gallinula chloropus*) built their nest by the margin of the ornamental pond at Bell's-Hill, a piece of water of considerable extent, and ordinarily fed by a spring from the height above, but into which the contents of another large pond can occasionally be admitted. This was done while the female was sitting, and as the nest had been built when the water level stood low, the sudden influx of this large body of water from the second pond caused a rise of several inches, so as to threaten the speedy immersion and consequent destruction of the eggs. This the birds seem to have been aware of, and immediately took precautions against so imminent a danger. For when the gardener (upon whose veracity I can safely rely), seeing the sudden rise of the water, went to look after the nest, expecting to find it covered, and the eggs destroyed, or at least, forsaken by the hen, he observed, while at a distance, both

birds busily engaged about the brink where the nest was placed, and, when near enough, he clearly perceived that they were adding, with all possible dispatch, fresh materials, to raise the fabric beyond the level of the increased contents of the pond, and that the *eggs* had by some means been removed from the nest by the birds, and were then deposited upon the grass, about a foot or more from the margin of the water. He watched them for some time, and saw the nest rapidly increase in height, but, I regret to add, that he did not remain long enough (fearing he might create alarm) to witness the interesting act of the replacing of the eggs, which must have been effected shortly afterwards; for upon his return, in less than an hour, he found the hen quietly sitting upon them in the newly-raised nest. In a few days afterwards, the young were hatched, and, as usual, soon quitted the nest, and took to the water with their parents. The nest was shewn to me *in situ* very soon afterwards, and I could then plainly discern the formation of the new with the older part of the fabric.

Observations on the Strata of Berwickshire and North Durham. By
ROBERT D. THOMSON, M. D.

THE Edinburgh coal-beds which have recently attracted so much attention, in consequence of the discovery in their most ancient elements of several remarkable fossil fish, are interrupted, in their continuity southwards, by the Lammermuir range, and again appear on the banks of the Tweed, along the southern boundary of the Merse. Now, the great problem requiring solution is, What is the age of the Berwickshire strata, which occupy the interval between the Edinburgh and Northumberland coal-beds? In a former paper, which I read before this Club soon after its institution, and which was subsequently published, I described the central part of this county, including, in my observations, particularly what I termed the New Red Sandstone formation, which comprehends by far the greater portion of the Merse, and was therefore well deserving of an attentive consideration. My object was simply to describe the rock as it was presented to me during a very careful examination, more especially within the limits to which I then confined myself; and I adopted this name, *first*, because it had previously been applied to this formation in this particular locality, both by Mr Smith and Mr Greenough, in their respective geological maps of England; and, *second*, because I considered the facts which I had accumulated were sufficiently strong in favour of the idea, that this designation had been correctly applied by these geologists. For, according to the general notions which prevailed, relative to the position of the new red sandstone, it was held by geologists, that the sandstone which lay over magnesian limestone belonged to this formation, the magnesian limestone itself being superior to the carboniferous

series. Now I traced a calcareous rock lying under the Berwickshire sandstone (which, it should be observed, is characterized by containing beds of sulphate of lime) for three miles, in a northerly direction from the Tweed at Birgham, and as many to the westward from the same point. In addition to this, I analyzed the rock, and found it to consist of one atom of carbonate of lime, and one atom of carbonate of magnesia, a composition exactly similar to that of the magnesian limestone which occurs on the coast near Sunderland. What could be the legitimate conclusion from these facts, then, but that this rock constituted the magnesian limestone formation; and that whatever sandstones I should find in contact superior to it, would belong to the new red sandstone formation? If the magnesian limestone had occurred only in the form of thin beds of insignificant extent, then it might have been granted, without compromising the claim of that rock to the title of a formation, that the rock with which they were connected was a member of the carboniferous series, or even had its position beneath them: but this was not the case; and therefore it is as clear as the orb of day when at its meridian brightness, that if the Berwickshire sandstone belongs to a series which is older than the carboniferous rocks, the magnesian limestone is still older than the latter set of strata; and, further, that the sandstones overlying the magnesian limestone, and which have been hitherto termed new red sandstones, are also older than the coal rocks. Hence it will be impossible to make any distinction between old and new red sandstone. That the Merse rocks are intimately connected with the carboniferous group, is obvious, from the circumstance of our meeting with considerable remains of plants in the quarry at Whitsom, bearing a strong resemblance to *Calamites*. But is it not agreeable to what we should expect to meet with, that rocks deposited subsequently over others, should approach somewhat in their nature? I have already stated this in some botanical observations published in the last number of the Transactions, and written in July or August last year. I have in vain long endeavoured (and many a day have I fruitlessly pursued this important object) to discover a section where the junction of the red sandstone, and decidedly coal rocks, could be detected. But until their relative positions are demonstrated, it would be unphilosophical to deny that the Berwickshire sandstone is new red sandstone.

Having made these remarks, in order to excite attention to the elucidation of the age of the Berwickshire strata, I proceed to state, that the true coal strata only begin to exhibit themselves on the banks of the Tweed. At Lennelhill, where fossil vegetables have been so unmercifully quarried by amateurs, so as to leave scarce a vestige for the man of science, the only person to whom they could be of the slightest value, the limestone and shale containing microscopic shells are clearly members of the carboniferous group. They occupy a considerable portion of the banks of the river in this neighbourhood; but

at no great distance to the westward, in the direction of Coldstream, the schistose and calcareous sandstones, which frequently accompany the Berwickshire sandstone, make their appearance, and continue, with little change, to the point at Birgham where I have already described them as lying over magnesian limestone. The difficulty is to determine how these strata are situated in relation to each other. It is evident that they are closely connected: but we ask, is the position of the sandstone above, below, or collateral with the carboniferous rocks? I have stated the reasons which induced me to class it with the new red sandstone. No argument can sufficiently controvert my statements, except observations on the rocks *in situ* demonstrating the contrary. Such I hold to be the *experimentum crucis*.

The western boundary of the North Durham coal-beds is indicated by the course of the river Till. For a little to the west of Duddo they may be seen cropping out, and dipping from south-west to north-east. I have examined the strata in this neighbourhood, and am happy to be able to add to the interest of this coal tract, by presenting a section of the new shaft at Greenlaw-wells, which was commenced in 1832. For this I am indebted to the attention of the son of the late intelligent overseer, in company with both of whom, and one of the proprietors (Mr Young) I descended on the 8th of November 1833. Although the observations which follow are few, and perhaps of little moment in so far as theory is concerned, still I think they are sufficiently important to require a place in the Transactions of our Club, because they are facts, and facts are eternal. The shaft is about $31\frac{1}{2}$ fathoms in depth; the section presented by it, being that of varieties of sandstone and shale, of various extent and thickness. Over the coal which is worked, situated at the depth of 27 fathoms, lies a black limestone, which is also observed underneath it. Above the limestone which is situated over the coal, there is a stratum of shale, or *tills*, as the workmen denominate it, filled with impressions of palm-like plants and bivalve shells. In some places the superjacent limestone is absent, and the shale occupies its place; and as it forms the roof of the level or drift, as it is termed, the fossil vegetables can be seen to great advantage.

The whole series dips at an angle of 45° , in a north-easterly direction. Hence it is obvious that the coal would soon disappear, and attain such a depth as to render its being worked a matter of impossibility. Yet coal is raised in four or five places, in a line from Duddo to the sea. The Cooper-eye coal, which is worked at Greenlaw-wells, is understood to prevail in each of these localities, and therefore it must be raised or brought nearer the surface in many points. This is rendered more probable, when we consider that there is an extensive trap-dike running from the Till to the sea, which may have been the instrument in producing the extraordinary convulsion in this carboniferous series in the neighbourhood of the Tweed.

It is to the rough-quartzose sandstone that is observed at the surface near Greenlaw-wells, that I am inclined to attribute the position of the fossil tooth, which was found by one of our members, the Rev. Mr Knight of Ford. The rocks at Ford and at Greenlaw-wells seem to approach each other in their composition, and both are near the surface. Dr Grant, to whom I shewed the specimen, was of opinion that it belonged to a fish. It consists essentially of phosphate of lime, but effervesces when it is touched with acid. The minuteness of the size of the specimen, however, has prevented me from obtaining any satisfactory results in reference to its quantitative analysis.

Dr Johnston informs me, that the *Lepidodendron Sternbergii* has also been observed at Ford, in the same sandstone, and impressions of ferns (*Sphenopteris*?). The position of the locality where these remains are observed, is about two hundred yards from the mouth of a coal shaft.

The sandstone consists of a yellow calcareous basis, mixed with clay, which serves to agglutinate irregular grains of white quartz, and exhibits cavities lined with carbonaceous matter. The Greenlaw-wells sandstone is likewise yellow, coarse, and consists of large grains.

The Cooper-eye coal, although thin, when compared with coal beds in other places, forms a good burning material. The levels formed during its working are on an average $3\frac{1}{2}$ feet high. The coal is removed between two levels, and its place supplied by the limestone, which lies on both sides of the coal. The immense pressure frequently crushes these supports, and when any considerable quantity of country has been mined, the surface sinks. The effect of this subterraneous quarrying is very visible upon Duddo Tower, which has been rent from top to bottom, in consequence of being undermined, notwithstanding that it is situated upon a considerable eminence. In traversing the different levels I observed in one place a rent, the opposite surfaces of which appeared brilliantly polished. I found, upon attending minutely to the adjoining strata, that this was caused by one portion having subsided, while the corresponding part had remained stationary. The consequence had been violent pressure upon both surfaces during the subsidence of the former.

I made many inquiries with regard to the occurrence of accidents in the mines in this neighbourhood, and learned that they were very uncommon. Inflammable air or carburetted hydrogen never appears, its occurrence being confined to deep mines. The only inconveniences arise from bad ventilation when the levels have been driven to a great extent, and the occasional disengagement of carbonic acid, which takes possession of the extremity of a level, and cannot readily be expelled. A man was lately killed by the influence of the latter cause. The consequence of the rarity of these accidents is, that no precautions are deemed necessary for the safety of the miners. No safety-lamps are employed,—a candle stuck in a piece of clay sufficing for all necessary

purposes. The name of a Davy lamp is not known, except to those colliers who have worked in the Newcastle mines. The workmen at the period of my visit appeared healthy. The wages of men were 20s 6d. per week, and of boys of sixteen years, 10s.

In order that the following table may be understood, I consider it necessary to explain the terms which are used by the miners, as they differ from those employed in other places; and I can do this with confidence, because I have examined the rocks to which the names were applied, along with the overseer of the mine:

Tiles—Shale, filled with shells and fossil vegetables.

Dent—Soft slate-clay or shale, with few organic remains.

Metal—Slate-clay.

Freestone—Sandstone.

Whin—Basalt. (The term Whin is applied in Berwickshire to all rocks except freestone and quartz.)

Seam—A coal bed.

Section of Greenlaw Wells' Shaft, North Durham.

	Fath.	Feet.	Inch.
1 Red gravelly clay,	1	0	0
2 Blue Metal,	0	5	0
3 Coal,	0	1	2
4 Limestone,	0	0	10
5 Coal,	0	0	6
6 Grey tiles,	0	1	3
7 Coal,	0	1	1
8 Blue tiles,	0	0	7
9 Freestone bed,	0	0	10
10 Coal,	0	1	1
11 White metal,	0	3	6
12 Grey freestone,	0	1	3
13 Blue metal,	0	0	4½
14 Coal,	0	0	4½
15 White metal,	0	4	3
16 Grey freestone beds,	12	2	0
17 Coal, called <i>Main</i> coal not workable,	0	1	3
18 Hard brown metal, slaty,	0	2	5
19 Good coal, rather splinty,	0	1	0
20 White metal, with limestone scalp,	0	1	3
21 Coal mixed with black dent,	0	1	0
22 Grey freestone mixed with charcoal,	0	0	3
23 Black metal,	0	0	3
24 Coal,	0	0	3
25 Dark brown metal,	0	1	3
26 Coal,	0	0	3
27 Limestone, very dun,	0	1	4
28 Good coal,	0	0	3
29 Blue metal,	0	2	6
30 Limestone with freestone scalp,	0	0	7

Carry forward,

	Brought over,	Fath.	Feet.	Inch.
31 Good coal,	0	0	5
32 Black dent,	0	0	4
33 Limestone mixed with metal,	0	0	5
34 Blue metal,	0	0	9
35 Coal mixed with black dent,	0	0	10
36 Brown freestone beds,	0	1	0
37 Grey do.,	0	0	10
38 Blue metal,	0	0	9
39 Grey freestone, with very hard sand,	0	1	1
40 Black dent,	0	0	2
41 White metal,	0	1	10
42 White hard freestone,	0	0	5
43 Grey do.,	0	2	0
44 White do., with metal partings,	0	1	7
45 Grey freestone beds,	0	3	9
46 Coal,	0	0	2
47 Grey freestone,	0	1	9
48 Grey freestone beds,	0	3	6
49 Coal with blue metal,	0	0	8
50 Hard grey freestone,	0	4	0
51 Brown freestone beds,	0	0	9
52 Blue metal,	0	0	3
53 Hard white freestone,	0	0	8
54 Grey freestone bands,	0	0	11
55 White metal,	0	2	5
56 Hard white freestone,	0	0	5
57 Blue metal,	0	0	2
58 Hard grey freestone,	0	0	9
59 Soft freestone beds,	0	0	6
60 Hard grey freestone,	0	0	4
61 White freestone beds,	0	1	3
62 White metal,	0	0	4
63 Grey freestone beds,	0	0	8
64 Hard white freestone,	0	1	3
65 Blue metal,	0	0	2
66 White freestone,	2	0	0
67 Blue metal,	0	2	5
68 Limestone,	0	2	5
69 Coal,	0	0	6
70 Blue metal,	0	2	7
71 Grey freestone band,	0	0	4
72 Coal,	0	2	3
73 Blue metal,	1	1	2
74 Grey freestone bands,	0	0	9
75 Grey tiles,	0	1	9
76 Limestone,	0	1	1
77 Coal worked, called the <i>Cooper-eye Coal</i> ,	0	2	3
		31	3	4

LONDON, 8th July, 1835.

Notice of the Skeleton of a Red Deer (Cervus Elaphus) found at Cheswick, North Durham. By J. S. DONALDSON, Esq.

ON the 2d June 1835, some workmen engaged in making a drain upon the farm of Mr George Scott, in the township of Cheswick, North Durham, having dug to the depth of five feet, came upon the head of what they conceived to be the skeleton of a horse, but which, on a further examination, proved to be, as I shall endeavour to shew, that of a quadruped of the genus *Cervus*. The skeleton was in an upright or standing posture, embedded in a kind of mossy earth, above which was sand, and the workmen had to dig about four feet lower than the point where they found the head, before they succeeded in getting the whole of it out of the ground. I regret that I could not procure the entire skeleton, the greater part having been dispersed and buried again previous to my being informed of its discovery; and I particularly regret not having seen the head, which would have enabled me to have decided at once, and without any doubt, on the order and genus to which the animal was referable. But from the description of those parts of the skeleton, which I did not see, but which I received from Mr Scott and his workmen, particularly as to the absence of cutting teeth in the upper face, and the hoofs being cloven, as well as from the few bones which I was able to procure, viz. the two metacarpal or shank bones, and several of the ribs, which I have brought for the inspection of the members of the Club, I have no doubt of its being the remains of a Red Deer, *Cervus Elaphus*. No antlers were found, they having either been removed previous to our discovery, or else the animal had died at the period when the antlers were shed, and before the new ones were grown; or it may have been the skeleton of a female, which in general has no antlers. I may here remark, that antlers of the Red Deer have frequently been found in the bogs and low grounds of this township, some of which I have myself inspected. If I am correct in the supposition that these are the remains of a red deer, it would appear that these beautiful and majestic animals, which are now only to be found in a state of nature in the most remote and inaccessible parts of the Highlands of Scotland, in the New Forest in Hampshire, the higher moors and wastes of Cornwall and Devonshire, and in the woods and hills of Martendale forest near Ulswater, in Westmoreland, were once the denizens of our Northumbrian wilds and forests; and the country between Belford and the Tweed, including the Kylvie and Lowick hills and moors, appear to have afforded haunts well suited to their habits. Cultivation, and the increase of population, which, since the Union, have here in particular been so much extended and increased, have extirpated the larger beasts of chase, replacing them, however, with animals of much greater utility to man, and creating out of what was, at the period of the accession of King James the First to the English throne, a desert waste, one of the best cultivated and most fertile districts in the kingdom.

Remarks on the Tumulus at Cheswick. By J. S. DONALDSON, Esq. of Cheswick.

IN opening one of those tumuli situated at Cheswick in North Durham, in which our British, or perhaps Danish ancestors were accustomed to deposit their illustrious dead, I discovered an ancient tomb of rude construction, containing the remains of a human being in a state of great decay, every part of the skeleton, with the exception of the skull and larger bones of the legs and thighs, being nearly decomposed. Near the skull was found the head of a spear, being all that remained of the deceased warrior's martial accoutrements. This weapon is made of brass, and appears to have been highly polished. It is in good preservation, and is coated with verdigris. It is seven inches in length, and three in breadth at the base. Of the handle there was nothing remaining but two pins of brass, by which it had been secured to the head.

The tomb was composed of five large stones: two six feet each in length and twenty-six inches in width, set on edge, formed the sides of this rude sarcophagus. One stone at the head measuring thirty-two inches by twenty-six; another, of similar dimension, at the foot, and a very large flat stone formed a cover to the whole. The stones were in a rough and unhewn state, and appeared to have been procured from a rock of the encrinal limestone upon the adjacent beach. The tomb was placed upon the ground on a level with a surrounding field, about 250 yards from high water-mark, and the stones forming the tumulus from their water-worn appearance, had evidently been principally procured from the sea-shore. The height of the tumulus was about twenty feet, and the area of its base about fifty feet in diameter. A fine coat of smooth green turf covered the whole, and from the top was an extensive and beautiful view of the coast from St Abb's Head to Bamburgh Castle, including Lindesfarn, and the Inner Farn Island, &c. A range of similar barrows or tumuli is traceable along this coast, viz., North Durham. One was opened some years since about one-fourth of a mile to the northward of that now described, and was found to contain human bones, but no tomb, or any other remains of antiquity, was then discovered. Similar tumuli have been explored in this and the adjoining county of Northumberland of late, and with nearly the same results. In some, as at Buckton in North Durham, vases of clay, containing ashes, were found, and at North Charlton in Northumberland, a weapon like to that found at Cheswick was discovered. I am not sufficiently acquainted with the subject to determine whether the absence of the vase or urn in the Cheswick tomb, will refer it to an earlier or later period of antiquity. I should not omit to mention that before the workmen arrived at the tomb in the centre of the tumulus, they found several skeletons at an inconsiderable depth below the surface. These were lying promiscuously amongst the stones, and some of them were entire. In referring to Stackhouse's Illustrations of

British Tumuli, I find that the learned author conjectures, and with some probability, that in addition to the sepulchral character of these barrows, there is another and no less interesting light in which they are to be viewed, viz., as parts of an amazing system of vigilance and communication, in fact a species of telegraph extending over extensive districts. We are informed by Cæsar, that the Gauls, from whom the Britons descended, conveyed intelligence with wonderful celerity through the fields and cantons by shouting with all their might (De Bell. Gal. lib. 7, ch. 3), and the distance of 400 or 500 yards which intervenes between the barrows upon this coast appears well calculated for a telegraphic communication of this kind; and they are uniformly placed within sight of each other. I offer these remarks to the Club on the subject of Tumuli with the view of directing the attention of its antiquarian members to this curious and interesting department of British antiquities, and particularly for the purpose of endeavouring to ascertain the probable date and period of such places and modes of sepulture.

Contributions to the Entomology of Berwickshire. By P. J. SELBY, Esq.,
and Dr JOHNSTON.

Allanton, May 6, 1835

COLEOPTERA.

Cicindela campestris.	Elmis rugosus.
Clivina Fossor.	Enicocerus viridiæneus.
—— collaris.	—— Gibsoni.
Helobia nivalis.	Oiceoptoma rugosa.
(H. Gyllenhallii, <i>Ent. Edin.</i>)	Meligethes æneus <i>Ent. Edin.</i>
Anchomenus prasinus.	—— pedicularius.
—— albipes.	Micropeplus porcatus.
Agonum parumpunctatum.	Byrrhus dorsalis.
Pœcilus cupreus.	Cataphagus obscurus.
—— rufifemoratus.	—— lineatus.
—— versicolor.	Hypnoidus riparius.
Stomis pumicatus.	—— 4-pustulatus.
Amara familiaris.	Hylurgus piniperda.
Bradytus ferrugineus.	Nedyus assimilis.
Harpalus ruficornis.	(Ceutorhynchus assimilis, <i>Ent.</i>
Trechus collaris.	<i>Edin.</i>)
(T. fulvus, <i>Ent. Edin.</i>)	Merionus obscurus.
—— minutus.	(Barynotus obs., <i>Ent. Edin.</i>)
Tachys binotatus.	Sitona tibialis.
—— immunis.	Nemoicus oblongus.
Peryphus littoralis.	(Polydrusus obl., <i>Ent. Edin.</i>)
—— agilis.	Phyllobius Mali.
—— cnemerythrus.	—— viridicollis.
(P. tibialis, <i>Ent. Edin.</i>)	Apion flavipes.
Lopha 4-guttata.	Haltica nemorum.
Tachypus properans.	—— rufipes.
—— striatus.	Phaedon Betulæ.
Bembidium paludosum.	—— tumidula.
—— flavipes.	—— marginella.
Notiophilus striatus, <i>Waterh.</i>	Helodes Phellandrii.
Hydroporus alpinus.	Coccinella globosa.
Georyssus pygmæus.	Tachinus rufipes.
Elmis Volkmar.	Tachyporus analis.
—— variabilis.	—— marginatus.

Head Chesters, parish of Cockburnspath, June 17, 1835.

COLEOPTERA.

<i>Clirina Fossor.</i>	<i>Telephorus dispar.</i>
<i>Carabus catenulatus.</i>	———— pellucidus.
<i>Helobia brevicollis.</i>	———— testaceus.
<i>Anchomenus prasinus.</i>	———— bicolor.
———— <i>albipes.</i>	<i>Malthinus biguttulus.</i>
<i>Steropus maëdus.</i>	<i>Notaris acridulus.</i>
<i>Patrobus rufipes.</i>	(<i>Eirrhinus acrid.</i> , <i>Ent. Edin.</i>)
<i>Harpalus æneus.</i>	<i>Merionus obscurus.</i>
<i>Peryphus littoralis.</i>	<i>Othiorhynchus notatus.</i>
<i>Lopha quadri-guttata.</i>	(<i>O. picipes</i> , <i>Ent. Edin.</i>)
<i>Tachypus properans.</i>	<i>Sitona grisea.</i>
<i>Notiophilus tibialis.</i>	<i>Polydrusus micans.</i>
———— <i>striatus.</i>	<i>Nemoicus oblongus.</i>
<i>Elaphrus cupreus.</i>	<i>Phyllobius argentatus.</i>
<i>Colymbetes ater.</i>	———— <i>uniformis.</i>
———— <i>guttatus.</i>	———— <i>viridicollis.</i>
<i>Hydrobius minutus.</i>	<i>Apion Ononis.</i>
<i>Meligethes viridescens.</i>	———— <i>flavipes.</i>
<i>Cateretes Urticæ.</i>	<i>Oxystoma Ulicis.</i>
<i>Byrrhus pilula.</i>	<i>Crioceris cyanella.</i>
<i>Cataphagus limbatus.</i>	<i>Phaedon marginella.</i>
———— <i>marginatus.</i>	<i>Phaedon tumidula.</i>
———— <i>sputator.</i>	———— <i>vitellinæ var. vulgatissima.</i>
<i>Hypnoidus riparius.</i>	<i>Chrysomela Litura.</i>
<i>Aplotarsus testaceus.</i>	<i>Chilocorns 4-verrucatus.</i>
———— <i>Quercus.</i>	<i>Coccinella 13-punctata.</i>
<i>Athous hæmorrhoidalis.</i>	<i>Lesteva obscura.</i>
(<i>Anathrotus ruficaudis</i> , <i>Ent. Edin.</i>)	

LEPIDOPTERA.

<i>Lycæna Phlæas.</i>	<i>Harpalyce tristata.</i>
<i>Polyommatus alsus.</i>	<i>Euclidia Mi.</i>

NEUROPTERA.

Panorpa communis.

Earlstown, July 29, 1835.

COLEOPTERA.

<i>Agonum parumpunctatum.</i>	<i>Necrobia violacea.</i>
<i>Peryphus tibialis</i> , <i>Ent. Edin.</i>	<i>Coccinella oblongo-guttata.</i>
<i>Dytiscus marginalis.</i>	<i>Haltica ferruginea.</i>
<i>Gyrinus villosus.</i>	<i>Polydrusus undatus.</i>
<i>Elmis Volkmar.</i>	<i>Apion flavipes.</i>
<i>Enicocerus Gibsoni.</i>	<i>Lesteva obscura.</i>
<i>Nitidula obsoleta.</i>	

LEPIDOPTERA.

Charæas graminis.

List of Entomostraca found in Berwickshire. By Mr WILLIAM BAIRD,
Surgeon.

THE great Class CRUSTACEA is divided by naturalists into two general sections, the *Malacostraca* and *Entomostraca*. The greater number of the animals of this second division are contained within a regular shell, and they have therefore received the name of Entomostraca, from the two Greek words signifying "insects with a shell." Little attention has been paid by British naturalists to the history of those exceedingly interesting little animals, and what we do know of them, we owe almost solely to our continental neighbours. Baker, indeed, in his microscopical researches, has taken notice of several species, and given plates of them, but he has done little to add to our information with regard to their anatomy and economy generally. Joblot and Ledermüller, in their works on microscopical objects, have given plates also of several species; whilst De Geer, Schæffer, and several other celebrated continental naturalists of the last century, have added each a little to our knowledge of them. Linnæus included all that he knew in one genus *Monoculus* (so called from their possessing only one eye), and gives descriptions of nine species only. Otho Fridericus Müller is the first regular historian of these animals who has done them justice. To him it is that we owe the greater part perhaps of our knowledge with regard to their economy; to his labours we owe our acquaintance with so many curious little creatures; and to his eloquence is perhaps owing the further researches and more detailed histories of succeeding naturalists. His work on the Entomostraca, published in 1785, is one of the most interesting memoirs in Natural History that we are acquainted with; and though it appears from later naturalists that he has fallen into many errors, still it is the most complete and best history of the Entomostraca that has ever been published. Since the time of Müller, much has been done to add to our knowledge of these interesting animals; and the memoirs of Jurine, father and son, Ramdohr, and M. Straus, contain the most excellent and most minute histories of detached genera that can be met with. Their researches have been conducted with the greatest zeal and care, and their labours have been abundantly crowned with success, their memoirs leaving little to be done by succeeding naturalists but to add to the species. Hermann (fils), Daubebart de Ferussac, Adolphe Brongniart, and other continental naturalists, have also given some excellent memoirs upon detached genera and species, whilst our own celebrated Leach is the only British naturalist we know that has paid any attention to the history of the Entomostraca; his labours, too, being chiefly directed to the parasitic animals of the division. It surely is not from want of interest belonging to them, that the naturalists of this country have neglected the Entomostraca, for many of them are worthy of all admiration. "The multifarious and complicated structure of their body," says Müller in

his admirable work; "the wonderful agility of their members; the very great fineness of their organs; their singular method of living and copulating; their living in waters which our cattle and we ourselves are daily drinking; the evils which they may give rise to, and to which fishes are seen to be liable; the emoluments* which, although we are in the greatest part ignorant of, they nevertheless produce in the economy of nature; that these things are very worthy of being known, scarce any one will doubt. Not to mention their external similitude to shells and the natural transition which takes place in them from insects to testaceous animals, who ever knew before the *Cypris* was detected, of an insect quadruped?† Before the *Limulus* and *Caligus* were properly observed, who ever knew of an insect acephalous, or with a head scarcely visible? Who ever imagined of a copulation of two males and one female at one time, such as takes place in the famous *Pulex aquaticus*; or of an animal whose head was all eye, as we see in the *Polyphemus*? These and more wonders are to be met with in the history of the Entomostraca."‡ At commencing this catalogue, it was my intention to have prefixed some details of each of the genera, as they had come under my own observation, and as they have been made known to us by the continental naturalists; but I found that, to do justice to the subject, the paper would be swollen to too great a length, and that it would afford abundant materials for several papers which might be communicated at different intervals. I have confined myself, therefore, at present to the catalogue of the Berwickshire species of the Entomostraca, adding observations on each of the species as they occur. We are indebted to the labours of this Club for the knowledge of the fact, that Berwickshire and the district to which our labours extend, abound in a very great variety of species both of the animal and vegetable kingdoms, many of which too are very rare, some scarcely to be found in other counties; and we also know that the geology of the district is one of very great interest. Sea and land have both been ransacked, and made to give up their hidden treasures, and though the minute and microscopic insects which form the division Entomostraca have hitherto been neglected, I have no doubt that our county and district will yield a plentiful harvest to the gleaner in this department also. Dr Leach, in his article *Crustacea* in the Edinburgh Encyclopædia, has only enumerated sixteen species of Entomostraca as found in Great Britain, a list which is increased by Samouelle, in his *British Insects*, to twenty. This strikingly shews what little attention has been paid to the subject by British naturalists, as I have, in an autumn's search in one district, found thirty-eight species belonging to the order *Branchiopoda* alone.

* "It is the common opinion that it is the *Caligus* which forces the salmon from the sea up rivers towards the cataracts."

† The *Cypris*, according to M. Straus, has six feet, two being always concealed within the shell; according to Ramdohr they have four.

‡ Muller's *Entomostraca*, p. 4.

In the arrangement of the genera I have followed Latreille in Cuvier's *Regne Animal*; but with regard to species I have taken Muller as my text-book, along with Desmarest in his work on the Crustacea. Latreille divides the Entomostraca into two Orders, the *Branchiopoda* and the *Pacilopoda*. The order Branchiopoda he divides again into two principal sections, the *Lophyrota* and *Phyllopa*; to the first of which I for the present confine this catalogue.

CLASS ENTOMOSTRACA—ORDER BRANCHIOPODA.

SECTION I. LOPHYROTA.

GENUS I. CYCLOPS.

1. *Cyclops staphylinus*, Desmarest.—*C. minutus*, Muller, p. 101, tab. xvii. fig. 1-7.—*Canthocarpus staphylinus*, J. O. Westwood, MS.—Common in pools of fresh water and ditches. The figure of this species, as given by Muller, is but indifferently correct; I have therefore sketched it as it has occurred to me. Pl. II, fig. 1. Desmarest calls it "staphylinus," from its habit of turning up its tail like the staphylinus. From some difference in the antennæ, and from the peduncle attached to the tail, it has been proposed to form a particular division for this species. My friend Mr Westwood has formed a new genus of it, which he calls "*Canthocarpus*." Pl. II. figs. 19, 20, are the young of this species in different stages.

2. *Cyclops rubens*, Muller, p. 104, tab. xvi. fig. 1-3.—*C. castor*, Desmarest.—*Disptomus castor*, J. O. Westwood, MS.—Found in Dunglass Pond, and about Yetholm. It has been proposed to form a distinct group for the reception of this species, from the division of the inferior antennæ and palpi. It has been formed into a new genus by Mr Westwood, and called *Disptomus*. Pl. II. fig. 2 is the young of this species, a few hours after birth.

3. *C. lacinulatus*, Muller, p. 105. tab. xvi. fig. 4-6.—*C. castor*, Desmarest.—Found in Yetholm Loch, along with *C. rubens*. Desmarest makes the *C. cœruleus*, *rubens*, and *lacinulatus*, into one species, which he calls *C. castor*, the laciniae of this species being considered infusory animalcula attached to the tail. If it be a mere variety, it is somewhat curious that these animals should adhere only to this species, and that they should occur the same in Scotland as in Denmark.

4. *C. vulgaris*, Desmarest.—*C. quadricornis*, Muller, p. 109, tab. xviii. fig. 1-14, —*Pediculus aquaticus*, Baker, Microsc. p. 496, tab. xv. fig. 1-4.—*Monoculus quadricornis*, Linné, Fabricius, and Donovan.—Very common in all pools, ditches, &c. throughout the district. Desmarest has changed the name of this species from *quadricornis* to *vulgaris*, and much for the better, as the epithet *quadricornis* would lead one to suppose that this species alone had four antennæ, whereas all the species we know have that number. Pl. II. fig. 3, is the young of this species twenty-four hours after birth; and fig. 21, three weeks old, being the *Nauplius saltatorius* of Muller.

5. *C. minuticornis*, Muller, p. 117, tab. xix. fig. 14, 15.—Pools of sea-water at Cockburnspath and Berwick. The young is the *Amymone thyas* of Muller, p. 47, tab. xi. fig. 16, 17.

6. *C. brevicornis*, Muller, p. 118.—Pools of sea-water at Cockburnspath.

7. *C. Johnstoni*. Nova species. Pl. II. fig. 4.—Pools of sea-water at Berwick and Cockburnspath.—Body of four segments, tail of six, terminated by two short lobes, from which issue two long setæ, fully the length of the body. Superior antennæ of about six articulations, stronger than inferior pair. In the male there is a bulla about fifth articulation. In the female they are more slender, more setiferous, and destitute of bullæ. Inferior antennæ of three or four articulations; terminated by two or three short setæ. All four antennæ setiferous at base of articulations. Head beaked. Beneath the antennæ are two organs (palpi?) of two articulations, setiferous at base of articulations and at extremities. Beneath these are two organs, which Muller calls hands, of two

articulations, terminated by a strong curved moveable claw or hook; and beneath these again, are two double organs, or *membres particulières* of the French authors, each pair consisting of a short strong common footstalk, from which arise two flat bodies, the superior of which is the longer, of two articulations, serrated above, and terminated by three short setæ; the inferior, also serrated above, and terminated by three setæ, but consisting only of one articulation. From the three inferior articulations of the body arise three pairs of long setiferous feet; and from the second articulation of the tail arise the sexual organs in either sex. This species approaches the *C. chelifera* of Muller, but differs in many points when closely examined. In Muller's species there are no articulations to the body, which gradually tapers to the tail, and which he describes as "farciminis facie." The superior antennæ are only of three articulations; the inferior, which he calls "palpi," of two. The organs beneath these, which I call "palpi," are furnished with a claw, and only of one articulation, whilst the last pair of particular members, have only the shorter of the two bodies of which they are composed, serrated, the longer being entire. The male in Muller's figure has not the bullæ on antennæ.

GENUS II. CYTHERE.

None of the authors, since Muller's time, who have written upon the "Entomostraca," from their residing in inland situations, have had opportunities of seeing the insects belonging to the genus Cythere, as they are only to be found in sea-water. Their history, therefore, is in more obscurity than any of the other genera, both as regards their economy and the number of species. No new species, as far as I am aware, have been added to the five of Muller, by any of the writers on "Entomostraca;" but that there are more to be met with by a little investigation, is very evident from those I have discovered on the coast.

1. *Cythere flavida*, Muller, p. 66, tab. vii. fig. 5, 6.—Amongst Confervæ in pools of sea-water at Cockburnspath.

2. *C. gibbera*, Muller, p. 66, tab. vii. fig. 10-12.—Sea shore at Cockburnspath.

3. *C. reniformis*. Nova species. Pl. III. fig. 5.—Sea-shore at Berwick and Eyemouth, &c.—Shell reniform; flesh-coloured; covered with hairs; both extremities of equal size; antennæ furnished with numerous short setæ to all articulations; anterior feet falcate, entire; all the feet furnished with claws. This species approaches the *C. viridis* of Muller, but differs in colour, in both extremities of shell being equal, and in anterior feet not being serrulated. It differs from *C. lutea* in shell being covered with hairs.

4. *C. alba*. Nova species. Pl. III. fig. 6....Shore near Dunbar.—Shell white transparent, hairy, acute at posterior extremity, and broader at anterior; a rim round edge of shell whiter than the rest of shell; antennæ beset with short setæ at each articulation.

5. *C. variabilis*. Nova species. Pl. III. fig. 7. a. b.—Shore at Cockburnspath and Eyemouth.—Shell glaucous, without hairs, ovate, anterior narrower than the posterior extremity; anterior legs falcate, and furnished with pretty strong claws; antennæ slender, without setæ. This species varies much in colour and markings. Some specimens are white, with two black fasciæ, one at posterior margin, and the other across centre of shell, while the posterior extremity is marked besides by a beautiful reddish or bright bronze spot; fig. a., other specimens are of a light flesh colour, with the edges of shell slightly greenish, and the body of the shell marked with dark streaks running across. Some are altogether of a fine flesh colour; fig. b., while others again are of a very dark brown. All the varieties, however, agree in shape of shell, in size, &c., merely differing in colour and marking. Future observations may perhaps determine them to be of two different species.

GENUS III. CYPRIS.

1. *Cypris detecta*, Muller, p. 49, tab. iii. fig. 1-3.—*C. conchacea*, Desmarest.—Pool on Beaumont Water at Yetholm.

2. *C. strigata*, Muller, p. 54, tab. iv. fig. 4-6.—Brackish water on sea-shore at Thornton Loch, near Cockburnspath.

3. *C. vidua*, Muller, p. 55, tab. iv. fig. 7-9.—Dunglass Pond.

4. *C. pubera*, Muller, p. 56, tab. v. fig. 1-5.—*C. conchacea*, Leach and Latreille.—*Monoculus conchaceus*, Linné and Fabricius.—Ditches at Berwick, Cockburnspath, &c. Muller's figure does not appear to me to be a good one of this species.

5. *C. monacha*, Muller, p. 60, tab. v. fig. 6-8.—Dunglass Pond.

6. *C. candida*, Muller, p. 60, tab. vi. fig. 7-9.—At Cockburnspath.

7. *C. reniformis*, Dandebart de Ferussac, fils. Annales du Museum d'Histoire Naturelle, tom. 7. p. 212, (1806); Leach, in Edinburgh Encyclopedia, art. *Crustacea*.—Ditch near Berwick, and at Coldstream.

8. *C. Joannu*. Nova species. Pl. III. fig. 8.—Pool near Abbey St Bathans.—Shell roundish, ovate, narrower anteriorly than posteriorly; of a brown colour, with an orange mark across back of shell and lower margin; shell beset all round with rigid hairs, and covered with minute black points or dots; setæ of antennæ numerous, about twelve or more. Resembles *C. vidua* a good deal in shape, but differs totally in colour and markings. Differs from *C. pilosa* somewhat in shape, and in not being glabrous, but marked all over with black roughish-looking points.

9. *C. minuta*. Nova species. Pl. III. fig. 9.—Pool on Beaumont Water at Yetholm.—Shell broader posteriorly than anteriorly; elevated and rounded on upper margin; slightly sinuated on under margin; hairy all round; of a light brown colour with a tinge of green; body of shell smooth, shining; posterior legs terminated by one long claw; anterior legs furnished with a pencil of long hairs from penultimate joint, and terminated by several strong hairs or setæ; setæ of antennæ numerous.

10. *C. elongata*. Nova species. Pl. III. fig. 10.—Pool on Beaumont Water at Yetholm.—Shell much broader at anterior than posterior extremity, which is narrow and much elongated; elevated on upper margin towards anterior extremity, and sinuated on under margin more towards the posterior extremity; white; transparent; hairy; setæ of antennæ five or six; anterior feet of about three articulations, each articulation furnished with setæ; posterior legs denticulated.

11. *C. reptans*. Nova species. Pl. III. fig. 11.—Yetholm Loch.—Shell long almost elliptical, nearly plane on upper, and slightly hollowed out or sinuated on under margin, rather ventricose, hairy; densely ciliated on anterior extremity; the ciliæ on posterior extremity fewer but much longer, of a light colour with dark green markings, which appear to be rather irregular; both extremities have a large broad green spot, which send out processes as it were towards the centre, of the shell; antennæ and feet short in comparison to the size of shell. I have never seen this species swimming about in the vessel in which I have kept it, but always creeping on the bottom.

12. *C. Westwoodii*. Nova species. Pl. III. fig. 12.—Yetholm Loch.—Shell much elevated and rounded on upper margin, and sinuated on lower, broader at anterior extremity, green-coloured, semi-transparent, densely covered with pretty long hairs all over; second last joint of anterior feet furnished with a pencil of long hairs; posterior feet furnished with a short seta at each articulation, and with a long curved claw at extremities; antennæ indistinctly articulated.

13. *C. tristriata*. Nova species. Pl. III. fig. 13.—Pond at Little Swinton.—Shell ovate, ventricose, anterior extremity a little narrower than posterior, upper margin rounded, lower sinuated slightly, green, hairy; on the upper margin, nearly in middle of length of shell, there is a dark mark, from which run to posterior extremity three dark green streaks, the centre one of which is the most distinct and the darkest coloured; anterior extremity of a rather darker green than the rest of shell. Between the centre and most anterior of the streaks are five or six small lucid spots.

14. *C. hispida*. Nova species. Pl. III. fig. 14.—Pool on Beaumont Water at Yetholm.—Shell almost elliptical; the anterior extremity being a little broader than posterior: rather ventricose; very roughly and densely hairy; of a brown colour all over, with one or two dark brown marks running across centre of shell, in the anterior of which are four or five translucent spots; both extremities of a darker colour than other parts of shell. The whole shell is very hispid, spines rather than hairs covering the shell; antennæ slender; setæ seldom much divari-

cated, about twelve in number. The markings of shell are not in all specimens very distinct.

15. *C. lucens*. Nova species. Pl. III. fig. 15.—Yetholm Loch and pools on Beaumont Water.—Shell white, shining, without spot; almost opaque; ventricose; elevated on upper margin towards posterior extremity, and reniform underneath; anterior extremity narrower and flatter than posterior, which is arched and broad, the inferior angle being, however, prolonged to a point; a few fine hairs at each extremity. This species differs from *C. detecta* in being ventricose, and more arched in upper margin; and from *C. candida* in being reniform, in not being ovate, and in want of rigid hairs which beset that species.

16. *C. compressa*. Nova species. Pl. III. fig. 16.—Yetholm Loch.—Shell round-shaped, compressed, rather narrower anteriorly than posteriorly; of a grey colour, more or less deep; semi-transparent; at either extremity beset with fine hairs; in some specimens spotted as if little pieces were hollowed out; anterior feet provided with several long bristles; eye large; antennæ terminated by numerous long setæ. From the flat compressed shape of shell, its motion through the water is very much like that of some species of *Lynceus*.

GENUS IV. DAPHNIA.

1. *Daphnia quadrangula*, Muller, p. 90, tab. xiii. fig. 3, 4.—Ditch near Berwick.

2. *D. pulex*, Desmarest, Leach, Latreille.—*D. pennata*, Muller, p. 82, tab. xii. fig. 4-7.—*Monoculus pulex*, Linné and Fabricius.—*Pulex caudatus*, Schæffer.—Near Berwick, at Coldstream, and near Rouring Linn at Fenton.

3. *D. sima*, Muller, p. 90, tab. xii. fig. 11-12.—*D. vetula*, Straus.—*Pulex non caudatus*, Schæffer.—Common about Cockburnspath, Yetholm, &c.

GENUS V. LYNCEUS.

1. *Lynceus sphaericus*, Muller, p. 71, tab. ix. fig. 7-9.—*Monoculus sphaericus*, Fabricius.—Common in all the ditches and ponds throughout the district.

2. *L. quadrangularis*, Muller, p. 72, tab. ix. fig. 1-3.—In the Pease Burn, and in a pool on Beaumont Water at Yetholm.

3. *L. lamellatus*, Muller, p. 73, tab. ix. fig. 4-6.—Yetholm Loch, and in a pool on Beaumont Water at Yetholm.—This is a very fine large species, about the size of *Daphnia pulex*, but Muller's plate of it does not appear to me to be a good one.

4. *L. trigonellus*, Muller, p. 74, tab. x. fig. 5-6.—*L. laticornis*, Desmarest.—Pond at Foulden, and at Yetholm.

5. *L. truncatus*, Muller, p. 75, tab. xi. fig. 4-8.—Pool on Beaumont water at Yetholm.—Muller says he found this species once in autumn 1782, but never met with it afterwards. It appears, therefore, to be a very rare species, and is a very beautiful one.

6. *L. harpæ*. Nova species. Pl. II. fig. 17.—Pool on Beaumont Water, and in Dunglass Pond.—Shell harp-shaped; ribbed longitudinally, the ribs resembling the strings of the harp; rounded posteriorly, sinuated anteriorly, and terminating in a point projecting forwards; antennæ four, long, nearly the length of the shell, each consisting of three articulations, and terminated by three long linear setæ; shell smooth, except anterior edge where it is situated, being there ciliated; tail serrated, terminated by two strong setæ; head rounded, and beak blunt. Differs from *L. truncatus* in sinuated anterior margin of shell, blunt beak, and long antennæ; in not being truncated on posterior extremity; in wanting the thirteen little teeth at the base; and in wanting the two thick and large upper feet: differs from *L. quadrangularis* in shape, in sinuated anterior margin, in more distinct ribs, and in blunt beak.

7. *L. hamatus*. Nova species. Pl. II. fig. 18.—Yetholm Loch.—Shell truncated anteriorly, and ciliated; upper part gibbous; tail not serrated, gibbous, terminated by two setæ; two upper feet large, and each furnished at extremity with a strong claw or hook curved upwards; antennæ of three setæ each: approaches *L. trigonellus*, but differs from it in beak being blunted and stronger; in tail not being serrated; in wanting the strong pediform organ below palpi and above the feet; and in the upper feet having the strong hooks.

An Address to the Members of the Berwickshire Naturalists' Club, delivered at the Anniversary Meeting held at Yetholm, September, 21. 1836.
By Sir WILLIAM JARDINE, Bart. President.

GENTLEMEN,

We have met after the lapse of another year, and it becomes me to follow the example which has been already four times so excellently set before me,—to give a brief sketch of the progress we have made, and of the things done and specimens captured, since we last commemorated the institution of the Club.

The last anniversary was held at the Bite-about Inn, Doddington, Northumberland, on the 16th of the present month, with an ample muster of members, and the company of Dr Douglas of Kelso and Mr Atherton, as visitors. The walk was at first directed towards the Routin-Linn, about two miles distance, a romantic dell and waterfall, the former richly clothed with a thick and tangled copse of birch and hazel, intermixed with a few stragglers of the monarch of the wood. The principal attraction here was to re-discover the *Osmunda regalis*, which was said to grow in this habitat. The locality appeared favourable, but the royal fern escaped the search of our botanists. Still, though the object of the excursion was not obtained, the party were compensated by the beauty of the scenery and the capture of some good insects. The walk was now continued eastward to an extensive marsh called the Horse-bog, and some interesting Coleoptera and Diptera were taken. In the course of the walk the *Myrica gale* was observed in profusion, a circumstance noticed here, because it is mentioned by Mr Winch to be rather a rare plant in Northumberland, and in general is accounted local in its distribution. In the whole of the northern part of this county, however, it abounds, running over, in almost more profusion upon the extensive moorlands on the border, where in the hollows, intermixed with stunted willow (*S. aurita* et *aquatica*), it becomes a favourite retreat for the blackcock, when its devotions to the female are past, and his plumage has to be renovated for the ensuing season. *Calamagrostis lanceolata*, a plant hitherto unnoticed in our district, was seen growing abundantly in the moss, intermixed with *Aira cæspitosa*, *Salix pentandra*, &c. On our return to the inn, and the usual duties being paid to the table, Mr Embleton's address, and the sketch of the labours of the bygone year, were attentively listened to, and the following papers were read:—"Notice of the Capture of a Honey Buzzard near Twizell, and of the Wryneck near Lucker, by Mr Selby." This was a communication of considerable interest, being a contribution to our knowledge of the habits of this comparatively rare bird. The district around Twizell appears to have something attractive to this species, for, within these few years, several specimens have been procured both in the adult and immature plumage. The bird in

question was accidentally observed to rise from the situation of a wasp's nest, which it had been attempting to excavate, or in fact to a certain extent had accomplished, and the large hole which had been scraped, shewed that a much greater power could be employed, and that the bird possessed organs much better fitted to remove the obstacles which generally concealed its prey, than a superficial examination of the feet and legs would warrant us in ascribing to it. A few hours afterwards, the task was found to be entirely completed, the comb torn out and cleared from the immature young; and after-dissection proved that at this season (autumn) at least, birds or mammalia formed no part of the food. A steel-trap, baited with the comb, secured the aggressor in the course of the next day, when we had returned to review the scene of his previous havoc. The next paper was on the Architecture of Holy Island Priory, by Dr Clarke, a place renowned in romance and classic in our poetry; and we would remark, that there are many buildings of antiquity, which have yet been untouched by the pen of a member. A meteorological paper, by Mr William Baird, concluded our essays for the day—"Remarks on the Sea Tree,"—a peculiar arrangement of clouds well known to mariners under the above title. The object of the paper was to shew the connexion between the different forms of clouds and the weather, and it may be recollected that the observations were detailed with the science of the meteorologist, and the feeling of the poet.

For my report of the remaining meetings, I regret that I shall be obliged to have recourse to the minutes only, but the accuracy of our secretary, I have little doubt, has left nothing wanting. In December, the Club held its usual meeting at Berwick. Miss Hunter and Miss Bell continued to increase the list of the Berwickshire Flora, by the addition of some fungi not previously seen within its bounds. *Agaricus ruber*, *odorus*, and *radicatus*, with *Cyathus vernicosus*, were recorded. The unusually stormy winter had already laid open some of the treasures of the deep, and the heavy gales of November had discovered some inhabitants which were not of every day occurrence. The Rev. Mr A. Baird read a notice of *Pleuronectes hirtus*, and of *Brama marina*, cast ashore at the foot of Dunglass Dean.* Dr Johnston laid the foundation of a Fauna, by reading a list of the zoophytes found on the coast of Berwickshire and North Durham, and made some interesting remarks upon the metamorphosis of the Crustacea. A series of the curiously formed "Fairy-stones" were exhibited by Mr Good, taken from a clayey bank on the side of the Tweed below New Water-haugh, and we would here remind you of a paper on the formation of these little nodules, which last year came before us, and is now printed in

* It was after similar storms in the February following, that the interesting addition to our British fishes, *Lutjanus rupestris*, was procured, two specimens being thrown on shore in Berwick Bay, and another on the shore at Bamborough.—See Mag. of Zool. and Bot. i. p. 167.

our last Transactions. The first part of the "Fauna of Twizell" was also laid before the Club, comprising the vertebrated animals, and the coleopterous and lepidopterous insects, and we cannot too much recommend the adoption of the plan of this paper to our members. It is, in fact, following out the principal object of the Club, and if done with care and attention to local circumstances, such essays would lead to our intimate knowledge of the habitats and geographical distribution of most, and in time of all, of our native species.—We had, in conclusion, from Mr Baird, Remarks on the Horary Observations made under the superintendence of our learned member at St Bathans; and an Account of the Aurora, as it occurred at Berwick, on the evenings of the 17th and 19th November, and which it will be interesting to compare with a paper which the same author read to us in the season of 1834.

The meeting for May took place at Houndwood Inn, an apparently favourable station, but rendered most unsatisfactory by the inclemency of the weather. Five members only were present; but they were gratified by the appearance of Dr Greville and the Rev. Mr Duncan as visitors. During the day, the incessant rain and cold north wind rendered all attempts at out-door work nearly fruitless, and some of the more common coleoptera only were obtained. By the botanists the remarkable *Podisoma juniperi communis*, a parasitic fungus upon the living juniper, was noticed. In the after part of the day, a paper was read "On the Proverbs, Popular Sayings, and Rhymes of Berwickshire," by Mr Henderson, which excited considerable interest, and gave rise to an after discussion.

At Chatton, June 15th. This may be called the meeting of the year. Favoured by a beautiful day, the Club met to breakfast in high spirits. The vicinity is excellent both for the botanist and entomologist, and Chillingham Park was the first object of the walk. Independent of its natural beauties, the extent of the domain and variety of wood and cover render it a spot most fertile for the excursions of the naturalist. The greater part of the forenoon was occupied in it, and the party were gratified by a sight of its peculiar ornament—the wild cattle, and by groups of red and fallow deer. Rass Castle, a hill within the park, was visited, and some rare insects were taken in the vicinity. *Campylis linearis* and *Carabus nitens* may be noted among the coleoptera; of the latter, three specimens were taken on the castle. Neither were the botanists idle. *Listera cordata* and *Trientalis europæa* were found, the latter in profusion on all the higher grounds. From the Park, the party proceeded to Hepburn Hill, but time had run, and allowed only a slight examination of a small portion of this rich ground. *Trientalis* continued in profusion, *Genista anglica* was abundant on the muir, *Myosotis repens* rendered every moist spot in the wood resplendent by its light blue flowers, and the birch was crimsoned with *Erineum roseum*, an addition to the fungi of the district. In the evening, a beautiful hybrid plant between *Iris Germanica* and *I. Florentina*, very

distinctly mixed, was exhibited by Captain Carpenter. Mr Parker shewed a fine specimen of the water-rat (*Arvicola amphibia*), with a pie-bald fur; and Dr Johnston produced a drawing of the *Phylline hypoglossi*, taken from a large halibut caught in Berwick Bay. Dr Clarke read a notice of an encounter between a hawk and bat, witnessed at Berwick at noonday, in which the former was unsuccessful, from the rapid manner in which the bat evaded the darts of its enemy, and the Doctor drew attention to the exquisite sense which these curious animals appear so peculiarly to possess. A very interesting table of the produce of the fishery at Sandstel, kept by the late Mr Waite for a period of eighty-two years up to 1818, was presented. From this table, it appears that 1745 was a year extremely unfavourable, 52 salmon only being taken; 1764 and 1765 are the most abundant, above 15,000 and 17,000 being severally taken. For the last ten years of the account, the *take* averages from 2000 to 6000 salmon, and from 3000 to 13,000 grilse.

In July we have to regret that there was no meeting—an untoward event, which we trust the zeal of the members will prevent any future President the pain of recording.

I have thus, gentlemen, very lightly sketched the results of the excursions and meetings of the last season, and I may be allowed to congratulate the Club upon its advance and continued prosperity. It must be considered, however, that we have had a season almost unexampled in the recollection of most of us, for its low mean temperature and general inclemency, both very unfavourable to the researches of the out-door naturalist; and the observations of some of our members on the east coast remarkably coinciding with my own, made at a residence on the opposite shores of the island, and situate nearly at the same elevation and distance from the sea, shew that over the north of England and south of Scotland, this unpropitious time has too uninterruptedly spread. Many of you may have observed the late appearance of the great proportion of the summer birds of passage. The song of those welcome visitors, which always conveys so many associations for the returning year, was expected for nearly fourteen days in vain, and when the arrival was proclaimed, it was soon perceived that some cause had materially diminished the usual numbers of these travellers.* The coleoptera, also, were much later in leaving their winter retreats, and among the Lepidoptera, there has been a remarkable deficiency of the *Geometridæ*, and of the greater portion of those *Noctuidæ*, which feed more particularly on the foliage of trees, circumstances that were perhaps occasioned by the remarkably cold and parched weather which

* It has been since remarked, that the departure of our summer birds of passage has been unusually early. Before the 1st September most of the warblers had departed, a few individuals only of *S. trochilus* remaining. *Hirundo rustica*, and *urbica*, were not seen after the 20th September, nearly a month before their usual time of departure. *Cypseli* have been recorded as rarely seen at all, in many parts of the island.

The fieldfare and redwing arrived between the 20th and 26th October, about a fortnight before the average time of their accustomed arrival.—W. J., 14th Nov. 1836.

occurred in May and June, and which was equally unfavourable to the development of the flowers and foliage of many of our native and generally hardy plants. But notwithstanding this unpropitious season, from the sketch that I have just now read, you will have seen that some subjects have been added to our Fauna, and some new plants to our Flora, besides considerable additions to our local knowledge of the district, within the boundaries of our range.

But I have another subject on which the Club has my warmest congratulations. Our little Proceedings tell more decidedly how much the value of such an institution is esteemed. Humble as they seemed at first, and printed and circulated without display, it must be gratifying to us all, that they have been already quoted in works which bear a high rank in zoology and botany, and that they may be now said to hold a place in the literature of the naturalist. Let me then entreat you to continue your perseverance; you have now to retain the eminence you have gained; much yet lies before you, particularly in the lower forms of our various departments; there is abundance which will bear to be re-examined, while one path, which was formerly recommended in an admirable address from this chair, still stands nearly clear,—that of the physiology and internal structure of the beings and plants which we have already been attempting externally to characterize. I would also hint at another object which the Club might now endeavour to attain: You are all well aware how much Berwickshire is indebted to one of our number for the illustration of its Flora, and it appears to me that if a sketch of a Fauna was made out, including all the vertebrata and invertebrata, so far as the notes in our possession would admit, that it would much facilitate the addition of species as they were discovered, and would be a guide by which members might direct their researches to the vacant parts, and finally fill the gap in the natural history of the county.

Leaving these hints for your consideration, it only now remains for me formally to resign my seat to one whom I trust will prove a more worthy successor, and I must express my regret that circumstances should have compelled me to be so frequently absent from our meetings, and to take so little share in the duties of the situation in which your partiality placed me, and at the same time I would offer my acknowledgments for your indulgence. From the time of my admission into the Club, I have felt a lively interest in its prosperity, convinced that if similar institutions were formed, we should soon learn, how much we had to learn of the natural history of our county. Neither is their any association more likely to lead to the discovery of objects of commercial or individual importance, while they may attain a still higher end; for by bringing individuals to a peaceable and rational converse, they point out what will ever become a healthy and useful recreation,—what will gain upon the mind, and will be a wholesome relief from the more severe studies incident to the necessary professions of the world; and I

have not yet met with the person who, from the casual observance of some beautiful natural object, or the example of some friend, has entered into our pursuits, who has not been led to enquire Who it is that hath gilded the insect's wing, and painted the blossoms of the wild flower, and ultimately to think of his presence

“—————That diffuses charms
Unspeakable, o'er mountain, wood, and stream.”

List of Members, continued from p. 69.

Rev. Dr Gilly of Norham, . . .	May 4, 1836.
Matthew Culley, Esq. of Fowberry, . .	June 15, —
Rev. R. Mitford Taylor, . . .	July 27, —
Sir David Milne, K.C.B., . . .	Sept. 21, —
David Milne, Esq. of Milne-Graden, .	— — —

Contributions to the Flora of Berwickshire.

1. ADDITIONAL SPECIES.

- AGARICUS *ruber*, *With. Bot. Arrang.* iv. 210. Woods at Anton's-hill, Miss Hunter.
- AGARICUS *odorus*, *Grev. Crypt. Fl.* tab. 28. Woods at Anton's-hill, Miss Hunter.
- AGARICUS *radicatus*, *Grev. Crypt. Fl.* tab. 217. Woods at the Hirsell, and at Anton's-hill, Miss E. Bell and Miss Hunter.
- CYATHUS *vernicosus*, *Bot. Gall.* ii. 865. *Nidularia campanulata*, *With. Bot. Arrang.* iv. 356. On decayed sticks, both at Anton's-hill and the Hirsell, Miss E. Bell and Miss Hunter.
- VERBENA *officinalis*. Gathered in a corn-field near Cockburnspath, by the Rev. A. Baird, and undoubtedly introduced with seed corn.

2. ADDITIONAL HABITAT.

- MENTHA *piperita*. In a ditch on the estate of Belchester, in great abundance, and at a great distance from any garden or cottage, Miss Hunter.

A Catalogue of the Zoophytes of Berwickshire. By Dr JOHNSTON.CLASS.—ZOOPHYTA, *Solander.*

SECTION.—POLYPIFERA.

ORDER.—HELIANTHOIDA.

<i>Fam. 1. Actiniadæ.</i>	variety— <i>A. crassicornis.</i>
Lucernaria auricula.	variety— <i>A. equina.</i>
convolvulus.	variety— <i>A. coccinea.</i>
Actinia mesembryanthemum.	Dianthus.
var.— <i>A. viduata.</i>	* *
gemmacea.	Tuediæ.

ORDER.—ASTEROIDA.

<i>Fam. 1. Pennatuladæ.</i>	<i>Fam. 2. Lobulariadæ.</i>
Pennatula phosphorea.	Lobularia digitata.

ORDER.—HYDROIDA.

I. GEMMIPAROUS.	Sertularia pumila.
<i>Fam. 1. Corynidæ.</i>	operculata.
Coryne glandulosa.	argentea.
squamata.	* *
<i>Fam. 2. Hydroidæ.</i>	thuja.
Hydra viridis.	Thoa halecina.
grisea.	Antennularia antennina.
<i>Fam. 3. Tubulariadæ.</i>	var.— <i>A. indivisa.</i>
Tubularia indivisa.	var.— <i>A. ramosa.</i>
ramosa.	Plumularia falcata.
var.— <i>T. ramea.</i>	pinnata.
	setacea.
	Catharina.
II. VESICULIFEROUS.	<i>Fam. 5. Campanulariadæ.</i>
<i>Fam. 4. Sertulariadæ.</i>	Campanularia dichotoma.
Sertularia rugosa.	geniculata.
polyzonias.	volubilis.
abietina.	syringa.
filicula.	dumosa.
nigra.	
rosacea.	

ORDER.—ASCIDIAOIDA.

<i>Fam. 1. Tubuliporidæ.</i>	Crisea luxata.
Notamia loriculata.	cornuta.
Crisea eburnea.	

Tubulipora patina.	Flustra truncata.
serpens.	carbacea.
<i>Fam. 2. Flustridæ.</i>	avicularis.
Cellepora Skenei.	var.— <i>flustroides</i> .
ramulosa.	var.— <i>avicularia</i> .
pumicosa.	pilosa.
Berenicea immersa.	membranacea.
trispinosa.	lineata.
variolosa.	unicornis.
ciliata.	<i>Fam. 3. Alcyoniadæ.</i>
coccinea.	Alcyonium gelatinosum.
nitida.	hirsutum.
* *	echinatum.
Cellularia scruposa.	* *
reptans.	? parasiticum.
ciliata.	<i>Fam. 4. Lymnophylli.</i>
Farcimia salicornia.	Cristatella mirabilis.
Flustra foliacea.	Plumatella Sultana.

SECTION.—PORIFERA.

ORDER.—AMORPHOZOA.

Grantia compressa.	Halichondria palmata.
botryoides.	ramosa.
ciliata.	papillaris.
pulverulenta.	var.— <i>panicea</i> .
nivea.	var.— <i>cristata</i> .
abnormis.	Spongilla fluviatilis.
Spongia pulchella.	

ORDER.—LITHOPHYTA.

Corallina officinalis.	Millepora lichenoides, <i>var.</i>
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Notice of the Capture of Pernis apivorus (Honey Buzzard), a rare species of the British Falconidæ; and of the Wry-neck. By P. J. SELBY, Esq.

THIS individual was caught in a steel spring-trap on the 28th of August last, under circumstances which, as illustrative of the peculiar habits of the species, I think it may not be altogether uninteresting to detail. On the afternoon of the 27th August, a large bird, apparently of the hawk species, was observed by Mr B. Atherton in the grounds at Twizell, to rise from the ground beneath the decumbent branches of a Platanus. Upon going to the spot, he observed a number of wasps (*Vespa vulgaris*) flying around, and part of a nest and broken comb scratched out of a large hole at the root of the tree, in which it had been built. The fact was mentioned on his return to the house, and from the circumstances detailed, I conjectured it might possibly be the work of a honey-buzzard; an inspection of the place an hour or two afterwards strengthened this supposition, as it was evident the aggressor had again been there, having nearly torn the whole of the comb to pieces, and cleared it of the wasps, grubs, and immature young with which it had been filled. At the suggestion of Mrs Selby, two steel-traps were set in the evening, close to the site of the destroyed wasp-hive, and baited with two large pieces of comb taken from another nest, destroyed a few evenings previously. Upon looking at them early the following morning, they appeared undisturbed, but during the course of the forenoon, the bird was again observed upon a tree within view of the traps, and apparently reconnoitering the place, and it then allowed of a near approach. It would appear, that whatever suspicions it might have entertained, it had not long been able to resist the cravings of its appetite, as it was found in the evening secured by its leg in one of the traps. From its size, I conjectured it to be a male, and such it proved upon dissection, and an adult bird, from the difference of colour, as contrasted with two birds of the year in my possession, as well as from the pure yellow of its cere and legs, those parts in the young being of a greenish grey. It measured 21 inches in extreme length, and 3 feet 7 inches in extent of wing; the cere was of a fine lemon-yellow, the top of the bill bluish-black, the iris dark bluish-grey; the tarsi about $1\frac{3}{4}$ inch in length, feathered in part about half-way down, the naked part and feet yellow. The claws very little arched, but sharp; the tail long, fan-like, and extending beyond the closed wings about $2\frac{1}{2}$ inches. The exterior plumage is of an uniform dark or umber brown, including the close-set feathers around the eyes, which, from their tiled disposition and firmness, appear well adapted to protect the face of the bird from the stings of hymenopterous insects. The bottom or lower part of the plumage is white, and a thick clothing of down closely invests the whole of the body. The tail

hair-brown, with bars of a deeper colour. The skin I found to be tough and thick. Upon opening the body, the craw and stomach were found filled with wasps, as well full-grown as in the nymph and grub state; no remains or feathers of birds, or bones and fur of mammalia were to be seen, so that, at this season at least, its food would appear to consist entirely of insects, and particularly the hymenoptera and their larvæ. The trunk and gently curved bill, as well as the straight claws of this bird, shew its departure from the typical Falconidæ, and its decreased predatorial habits. It was in tolerable condition, though not in the fat state of the individual killed at Thrunton, and described by the Honourable Mr Liddell in the Transactions of the Northumberland Natural History Society. While alive, it shewed no irascibility of disposition, and did not attempt to strike with its talons, and made no outcry. It was infested with that unpleasant looking parasite *Hippomya viridis*, several specimens of which were secured.

I have also to notice a beautiful specimen of the *Yunx torquilla* (wry-neck) shot by our associate Captain Mitford on the 1st of September, near Lucker. It was seen by him, threading in various directions a thickset hedge, and frequently exhibited the gesticulations and twistings of the head and neck peculiar to this pretty bird. It was in high condition, and loaded with fat, and, upon dissection, proved a female. The stomach was filled with ants, of the species *Formica fusca*, *Steph.* ? mixed with their pupæ: no other insects, or food of a different kind, was observable. The tongue of this bird, as in the woodpecker tribe, is extensile, and, except the tip, in the form of a cylindrical sheath, composed of elastic rings; it is kept moistened with a gluey saliva, secreted by large and appropriate glands; and, as in that family, the fumæ of the os hyoides are greatly prolonged, and after extending down to the nape of the neck, are then bent upwards, and, crossing over the crown of the head, above the orbit of each eye, are brought in contact immediately above the base of the bill.

The wry-neck is a very rare bird in this district, and this is the second instance only of my having met with it north of Morpeth. In the spring, when it first arrives, it is easily recognised by its loud and piercing cry, which somewhat resembles that of some of the small Falconidæ. It breeds in the holes of trees; but its soft fan-like tail shews that its scansorial powers are confined, and that its zygodactyle feet, like those of the cuckoo, are rather calculated for firm prehension in certain attitudes, and when the centre of gravity is frequently thrown considerably forwards, than for ascending the trunks or arms of trees.

Holy Island Priory. By HENRY CLARKE, M.D.

I HAVE been induced to draw up the following sketch of the Priory of Holy Island, from its being the most beautiful fragment of antiquity in the district to which our researches are confined, as well as from its presenting one of the most remarkable architectural remains of the period to which it belongs in the kingdom.

It need scarcely be mentioned, that, in the earlier periods of Christian history, the choice of so unattractive a site was in obedience to the idea which indicated the remote and scarcely accessible island, and the lone and unfrequented desert, as spots peculiarly fitted for that contemplative life, and withdrawal from the world, in which the perfection of religion was supposed to consist.

When the monastic system was introduced into the West, this was its leading and characteristic feature, and the same spirit which had selected the inhospitable island of Iona, induced the monk who issued thence for the conversion of Northumberland, to prefer the bleak sands of Lindesfarne to the pleasant valleys of the adjacent continent.

It would be needless also to dwell upon the advantages derived from monastic establishments during the darker periods of history—their preservation of literature and religion—the solace they afforded to the wayfarer and the pilgrim—the asylum they furnished to the poor, the sick, the impotent, and the aged—the influence which they exerted in alleviating, where they could not prevent, the various evils incident to a barbarous age—the peaceful arts which they cultivated, and especially that which enabled them to raise those august and sumptuous edifices, which still remain the grandest examples of architectural skill, and defy all approaches of the moderns to a parity of excellence.

The exercise of these and kindred virtues ought to redeem the monastic institution, when reviewed in a candid and equitable spirit, from the unmeasured obloquy and censure which the license and misrule of some of its branches in later times have drawn down upon it.

There is no doubt, however, that the very virtues, which originally inspired awe and attracted esteem, tended, by a natural process, frequently renewed, and always with similar results, to the gradual corruption and final overthrow of the monastic system.

Long before the Reformation the elements of discontent had been at work, and the clamour against the monasteries had been gradually acquiring force and fixedness, when in the person of

“the majestic lord
Who broke the bonds of Rome,”

was found a fitting instrument for the expression of the popular will.

In the year 1536, the lesser monasteries were doomed to destruction

by the execrable tyrant who then wielded the sceptre of England, and the Priory of Holy Island was included in the general wreck.

From that hour it dates its gradual decay and present state of irretrievable ruin. Sir Walter Scott has thus described it in "*Marmion*."

"In Saxon strength that abbey frown'd,
With massive arches broad and round,
That rose alternate row on row,
On ponderous columns short and low,
Built ere the art was known,
By pointed aisle and shafted stalk,
The arcades of an alley'd walk,
To emulate in stone."

The latter part of the stanza is a complimentary allusion to the fanciful theory of Sir James Hall concerning the origin of the pointed arch. The application of the term *Saxon*, it would be impossible to verify or substantiate.

There are no buildings in this country with the characteristic forms of this church, or the distribution into nave and aisles, that belong to so early a period. A few rude structures there certainly are which may have been erected by Saxon architects, one of which occurs in our own district—the tower of Whittingham Church, Northumberland—characterized by a peculiar sort of quoining—consisting of long and short stones, placed alternately over each other—small round-headed apertures divided by a rude baluster, and the absence of buttresses. The term Norman may be safely used, if it be understood simply to designate a style which appeared in this country at the conquest, and prevailed for 125 years, during the Norman rule; but it is in reality Roman, and was derived from the Imperial city by the architects who diffused it over Europe, with the religion to which these structures were consecrated. It flourished during the first thousand years of the Christian era, with long interruptions during the dark ages, but its rudiments may be discerned at this day in the Temple of Peace at Rome, erected during the first century, and in the Halls of the Baths—those colossal structures in which the grandeur of thought and magnificent aims of the Roman people are most conspicuously combined. In these edifices we perceive the general arrangement of our Norman and Gothic churches—a wide central space arched over at top, with the vaults resting on pillars corresponding to our nave; between these pillars lofty arches open into as many vaulted apartments on either side intercommunicating by similar archways and constituting side-aisles. The roof of the side-aisles being considerably lower than that of the central vault, admits the insertion of lights in the main wall looking into the nave, which correspond with our clerestory windows.

The general character of Holy Island Priory is Norman, or to speak more correctly, Romanesque. The west front is almost perfect—

remarkably so when we consider, that, in buildings of that period, this part has generally undergone a change, by the insertion of windows of a later style, leaving only the Norman door below to point to the real date of the structure. Here, we have a door of great depth and richness of effect from the number and boldness of the ornaments. On either side are plain semicircular blank arches—but not intersecting—and the whole was flanked by towers, one of which still exists. Of the nave, the southern portion as well as the south aisle is entirely gone, but that on the north is tolerably complete. The piers, with their capitals, which bore up the arches, are of various patterns, channelled, lozenged, shafted, and shewing in their sculptured surfaces, and the various fretwork of the arches, that is, in the only decoration which the style admitted—the germ of that inexhaustible variety and multiplicity of ornament which was in the sequel to characterize the Gothic.

The nave as well as aisles, has been vaulted in stone, as is evidenced from the vaulting shafts, and commencing springers still seen at the junction of the nave and transepts, and from the curve of the vault itself, yet traceable at the west end, but denuded of its ribs. This is a remarkable and almost singular instance of the centre aisle of a Norman building receiving a vault of stone. Both in England and on the Continent, the nave was covered simply by a flat boarded roof, to which were in a great degree owing the frequent and destructive fires of our early churches.

There are six arches in the nave, but the last is of smaller dimensions than the rest. This peculiarity is not unfrequent in Norman and Gothic churches, as if the architect had not previously calculated the space to be occupied by his arcade. The effect here has been to produce a horse-shoe instead of a semicircular arch, from its being of the same height, but lesser span, than the others. This arch is very rare, even in Norman buildings.

Above the pier arches there has existed a triforium, of which the only remains are a single shaft at either end of the nave, the beginning and termination of the arcade. The Norman triforium is in England simply a row of openings or pannels in the wall, to fill up, ornamentally, what would otherwise have been a blank space. In Germany it is a real gallery, and appropriated to the young men, and called the *Männer-chor*.

Of the vaulting of the north aisle one arch still remains, but flattened at top, and only retained in its position by the wedge-form of the stones which compose it. This will soon fall, and yet might be easily preserved. The vaulting was quadripartite—the piers, with their cushioned capitals, and transverse ribs, are yet seen. In one or two places, the vaulting from pier to pier yet remains, though the ribs which would have appeared to support it are gone. This is a proof that the ribs used in vaulting were introduced merely to satisfy the

mind by *appearing* to support the arches above, and that the eye, which had been accustomed to strong lines in every other part of the building, should not here rest in a blank surface.

We now reach the intersection of the nave and transepts. Here in the strong and massive piers, we have slender circular shafts set in square recesses—a style of transition from the short and heavy Norman to the loftiness and exility of the Gothic, by which the weights above being distributed to different and independent props—an air of lightness and grace is produced without any diminution of security or strength.

Above, arose the tower which crowned the whole structure, but of its existence the only remaining evidence is the most singular and beautiful feature of the ruin. It is the great cross rib traversing the vault diagonally from N.W. to S.E., and spanning the mid-air free and unconnected with the building but at its spring. Had this been a pointed arch, it would have fallen with its superstructure, but the pressure of the round arch being only at the sides, it is likely to endure as long as the parts which buttress it up.

The chancel beyond the transepts had originally a semicircular termination, as is still discernible on the floor,—a feature retained in all the Norman churches abroad. In this part of the edifice, it is to be regretted, is a departure from the unity of style which pervades the rest of the fabric—the circular apse has given place to a rectangular, lighted by pointed windows, in compliance with the fashion of the day, and in violation of the grave simplicity of the rest of the structure.

Buttresses of slight projection run all round the building. They were scarcely needed by the Norman architects, from the enormous thickness of their walls, and their inferior height; but in them we may trace the rudiments of what became, in the hands of the Gothic builders, so beautiful and necessary a member, shooting up into airy pinnacles and spires, and impressing a lofty and majestic character upon the whole.

Of the conventual buildings the traces are few and indistinct. The most important to their comforts—the vast kitchen chimney yet remains in all its original strength and completeness. The large walled space adjoining was probably the Refectory, with which the kitchen would communicate by the buttery-hatch.

The building is now secured from violence and wanton dilapidation, and as it has only to contend against the silent erosion of lichen and wallflower, we may hope that it will long continue to adorn our district—a monument of a far distant age and far different state of society, and a beautiful and affecting link between the past and the present.

Remarks on the Sea Tree. By MR WILLIAM BAIRD.

EVERY person, the most unlearned even in the science of meteorology, it may be observed, pretends, by looking at the clouds, to be able to foretell the changes of weather; and many whose occupations lead them to be much in the open air, have attained a very considerable degree of knowledge in the matter. From observing that under certain states of the clouds a change of weather has taken place, the weather-wise can with considerable confidence predict a similar change to take place, upon certain circumstances occurring again. Such observations may be duly authenticated, but it is more difficult to assign a satisfactory reason for the change taking place.

The object of this paper is to lay before the Club a few observations upon a variety of one of the modifications of clouds, as connected with the weather, which I have made at various times and places; and though I shall not perhaps be able to assign a satisfactory reason why such a connexion should exist, I hope that the establishing the fact, that there is such a connexion, will be more valuable, and perhaps better suited for this Club, than an ill-contrived theory to support the assertion. The great object of this Club is to collect facts; and we should always bear in mind, that whilst the finest spun theories have been swept away, like the gossamer web, or the morning mist, before the first breeze of wind that has blown, or have vanished "like the Borealis race, that flit e'er ye can point their place", the hardier and more stubborn facts upon which they have rested, have withstood the hardest gales—as the mighty oak, "the monarch of the wood," only rises stronger from every blast that blows, and strikes its roots the deeper in the ground, the more the tempest strives to overwhelm it,—so they have only gained more strength and stability from the rude assaults that have overthrown the superstructures which have been built upon them.

Of the seven modifications, or species, into which Howard and other meteorologists have divided the clouds, three are simple and primary, the others are compound. One of these primary species, calléd the "Cirrus or Curl-cloud," is perhaps the most beautiful and diversified, and is certainly the highest of all the modifications. Every person must be acquainted with it in some one or other of its varieties—those beautiful white, almost transparent, and finely formed tufts, like locks of silken hair, which we so often see in fine weather pencilled high up in the clear blue sky, especially when we have the wind in the east, and from which shape the cloud takes its name of "cirrus or curl-cloud"—the wild, dishevelled, streaming, poetical-looking appearance, which the same lock of hair puts on at times, called the grey-mare's tail, proverbial as a forerunner of a gale—the beautifully reticulated and scale-like cloud, which we often see at an amazing

distance in the cerulean sky, and which gives us some faint idea of the immensity of space, since our familiar friends the clouds are at such a distance,—a cloud which is well known to seamen as a prelude to a stiff breeze, and called the mackerel back*—these or some other of its varieties are known to almost every one. The way in which this cloud perhaps most generally makes its appearance, is a milkiness, or turbid whiteness diffusing itself over some part of the heaven. This gradually either descends in the atmosphere, or becomes more condensed, and takes on some more decided appearance, such as one of those I have already mentioned, or without taking on any of those decided forms, stretches itself in long lines over the sky, and passes gradually into one of the compound forms, “cirro-cumulus” or “cirro-stratus.” The “cirro-cumulus” has been finely described by the poet Bloomfield, “the beauteous semblance of a flock at rest,” and may be considered the cloud of fine weather. The “cirro-stratus,” however, figures in many a sad change, and it is frequently in combination with this compound form, that the “cirrus” is seen a mark of bad weather. In variable and showery weather, when the shower has passed away, and all appearance of rain is gone, when a few rocky “cumuli,” or some detached portions of “cirro-stratus” are only to be seen lingering in the sky, we often perceive, shooting up between two or three of these clouds I have mentioned, a light fleecy almost transparent cloud, branching out at one side into fine radiations, like the down upon a feather, and hence called “plumose cirri;” when such are seen, we may almost certainly conclude that the weather will continue changeable, and showers will again prevail. This modification or variety is generally met with in showery weather; but there is another somewhat resembling this one which is very frequently only to be met with during a continuance of fine settled weather, and which may be understood when I describe it as two of these “plumose cirri” united, rendering it plumose on each side, or giving somewhat the appearance of a tree, and called, I believe, by the natives of Norfolk, the “Sea-Tree.” It is this variety that I have selected as the subject of this paper, and which, with few exceptions, I have generally found as a sure sign of approaching rain. The weather has been fine and settled-looking for some time, the sun rises clear and unclouded, his mid-day ardour is moderated perhaps somewhat by those elegant shaped parasols of heaven,—the beautiful fine weather cumuli; whilst he sinks in the evening to his western pillow in a flood of glory. Day after day the same succession of weather takes place, and a long continuance of such is predicted, till at last, on some warm or sultry day, we perceive the “sea-tree” make its appearance, perhaps isolated and waving its branches at an immense distance in the heavens, perhaps

* “Mackerel backs and mares’ tails,
Make lofty ships carry low sails,”

is an adage well known at sea.

its stalk rising out of a bank of "cirro-stratus," its feathery or arboresecent summit flickering aloft and pointed towards the wind, and immediately the meteorologist acquainted with its appearance, foretells a change. I have observed this cloud in many different parts of the world, and I have watched with great interest the change from dry to wet weather take place, and found the same change produced between the tropics, under the equator, in the burning climate of India, in the cooler latitudes of a southern zone, as well as in our northern clime, in the midst of the trackless ocean, as well as on land in our own county of Berwick. From a meteorological journal I kept some years ago, during a period of fifteen months in various parts of the world, I could produce many instances to prove the connexion which seems to exist between the appearance of this cloud, the "sea-tree," and wet weather. I could shew it uninfluenced by climate, and independent of previous weather—and producing the same effects when isolated from other clouds, as when connected with, or rising out of "cirro-stratus."—I shall, however, select the notice of a cloud of this description as seen very lately in Berwickshire, and the appearances of which were marked at the time. The unusual dry weather which has prevailed this last summer, renders perhaps the appearance of this cloud and the results more remarkable than it would have been, had the weather been wet and showery.

On the 3d of September, during a warm day, and after some continuance of dry weather, the prevailing clouds being "cumuli," I observed a bank of "cirro-stratus" hanging over the northern horizon, but at some considerable height from the horizon. The wind was very gentle and almost due south. When looking up some little time after to the "cirro-stratus," I observed, near the eastern part of the bank, two distinct "sea-trees" shooting out of it; their stalks, as it were, rising out of its substance, but at the same time distinguished from the body of the cloud by being darker in colour. They shot up into the sky, and their arborescent heads pointed and waved in the direction from which the wind was blowing. Whilst the "cirro-stratus" moved northwards with the breeze, the sea-trees rose up against it, and some less well defined clouds of the same description appeared rising out of the bank at its western portion also. These threatening clouds continued visible for some time, but gradually disappeared. As the afternoon wore on, however, "cirrus and cirro-stratus" blended, the one passing into the other, took possession of the sky, and shewed that some change in the atmosphere was already going on. About seven P.M. this stratum of cloud had partly disappeared, and I did not observe the appearance of the sky again that evening, which, however, was rather cold and chilly. In the morning, however, about six or seven o'clock, the sky was again seen to be covered with a pretty dense stratum of "cirro-stratus." "Cumuli" were mixed with it—the wind began to whistle—the stratum of cloud became denser—and

soon after "nimbus" formed, covered the whole sky, and rain began to fall, continuing throughout the forenoon. It cleared up during the afternoon to fine weather, which lasted till the 8th. In the evening of the 7th, about ten p. m., a bank of "cirro-stratus" was observed hanging over the eastern horizon, with the same kind of cirri, the "sea-trees" shooting out of its upper edge and pointing towards the south-west. No particular appearances had been observed, as indicating rain during the day, but the moment I observed this arrangement of clouds, as lighted up by the moon, which had just about eighteen hours before completed her full, I prognosticated that we should have rain next day. An hour afterwards I observed that the whole of the bank of "cirro-stratus," with its accompanying "sea-trees," had passed away, and the night looked still and clear. At seven a. m. of the 8th, however, the sky was already covered with a pretty dense stratum of cloud, very much resembling the passing of "cirro-stratus" into nimbus, and soon afterwards rain fell. The rain continued, with short intervals of fair weather, during the whole day and for most of the night; and for several successive days, we had abundance of the plumose variety of "cirrus" already mentioned, appearing in the intervals of large "cumuli," and accompanied, as I have also stated above is usually the case, with showery unsettled weather.

One of the great uses of the "cirrus," according to nephelologists, is the conducting electricity from one portion of the sky to another, and thus keeping up the electric equilibrium of the atmosphere—a purpose for which it is exceedingly well adapted, by the fine, tapering, needle-like points, in which cirrose clouds are generally seen to terminate. The passing a stream of electricity through a portion of water, produces a rise in the temperature of the water, for "in the transmission of the electric force," says Dr Murray,* "the transmitting medium, under a certain degree of electric intensity conveyed through it, sustains elevation of temperature." The clouds being water in the form of vapour, will in all probability sustain an increase of temperature also, when a current of electricity is passing through them, and thus most likely increase the temperature of the surrounding atmosphere as well. Even when no clouds are visible, there is still a quantity of watery vapour in the sky, which will be heated by the electric stream. The "sea-tree" being a cloud, the greater part of which consists of a body of fine points, will in all probability be very intensely active in distributing electricity, and will no doubt, during the time it remains visible, have conveyed a large portion of this mysterious power through the aqueous vapour, in that portion of the heavens where it is situated, and thus not only have increased the temperature of this vapour, but also of the atmospheric air surrounding it. In the description of the "sea-tree" in the former part of this

* Murray's Chemistry, vol. i. p. 383.

paper, I have stated that the arborescent head of the cloud pointed towards the quarter from which the wind blew, and from which the rain afterwards came. Now, if the cloud be situated in the northern part of the sky, the air and aqueous vapour will in that quarter have sustained an increase of temperature—becoming thus more elastic, and rising up in the atmosphere, a greater or less degree of vacuum will be produced—the colder air from the south will rush in to supply its place—condensation of the aqueous vapour will be the effect—and rain in all probability will fall.

The Proverbs and Popular Sayings of Berwickshire. By Mr HENDERSON,
Surgeon, Chirnside.

IN laying before the Club the following proverbs, with the few remarks thereto appended, my motive is to preserve, as far as possible, some scattered remnants of the “rude forefathers of the hamlet” and the shieling; and I hope I will be excused in this humble attempt to illustrate these faint traces of the spirit and manners of the men of other times, seeing that the immortal Ray himself did not think it beneath his notice, to collect the apophthegms of bygone ages. The most of these sayings and proverbs may still be occasionally heard among our aged peasantry, but it is probable that in the course of one or two generations more, they will be entirely forgotten, and hence the necessity of giving them a permanent form in the Transactions of this Club. In other districts of the county, it is possible that other sayings may still be in common use among the people, as several of those noticed are of a very local nature, and seem to be confined to the eastern part of the shire: they are all, however, which I have been able to collect.

1. “*He has a conscience as wide as Coldingham Common.*”

Before the year 1777, Coldingham Common was an extensive and undivided waste, containing about 6000 acres. Since that period, some portions of it have been planted and improved, and during the last ten years, several feuars have taken up their residence upon it, and there protracted an uncomfortable existence on the scanty crop which it produces; but the greater proportion still remains covered with heath, interspersed with bogs and mosses. In ancient times, this Common constituted part of the forest belonging to the Abbey of Coldingham; and it seems to have been then partially covered with trees and brushwood—the roots of oak, birch, and hazel being still frequently found in the soil, and the peat-mosses being full of their decayed trunks and branches. This moor has a singularly wild, bleak, and dreary aspect, and extends several miles in extent in every direc-

tion: hence the proverb is with great appropriateness applied to those persons of lax principles who can accommodate their consciences to all circumstances, and who can stretch it to any extent to suit their selfish purposes.

2. "*The third and last of Ayton Fair.*"

As the pleasant and thriving village of Ayton is well known to all the members of the Club, it would be a waste of time to give any description of it here. When the good housewife has brought forth the last of her stone of meal, potatoes, &c., it is usual with her to repeat the above saying. How it originated, it is not easy to say.

3. "*This is like Hilton Kirk.*"

The ancient parish of Hilton now forms the eastern part of Whitsome. The kirk is in ruins, but its burial-ground is still used. The Rev. Daniel Douglas was minister here in Scotland's *persecuting times*, and he had to flee to Holland to escape the fury of his enemies. He seems to have been a man of apostolic simplicity, sincere piety, and every way endowed as becomes a minister of the Gospel. After the Revolution he returned to his charge at Hilton, and died there on the 24th July 1705, in the eighty-sixth year of his age, and his *Through* is still pointed out in the church-yard. A certain laird of Hilton, who had been freely reproved by Daniel Douglas for his licentiousness, so far forgot what was due to decorum, as to drag the reverend gentleman from the pulpit. Such a scene would naturally excite great disorder and confusion in the congregation, and hence may have arisen the proverb,—as it is commonly applied to a noisy assembly of village politicians, or when things are in great disorder about a house.

4. "*This is like Cranshaw Kirk, there's as many dogs as folk.*"

In a wild pastoral region like that of Cranshaws, lying in the midst of the Lammermuir Hills, it is usual for the shepherd dogs to accompany their masters to the church, and, in times of severe stormy weather, it may have happened that few people, except the shepherds, who are accustomed to be out in all seasons, could attend divine service; and in such circumstances, it may have occurred that the dogs may have equalled in number the rational hearers of the Word, and hence has probably originated the saying, which I have often heard applied by bustling servant-girls to a scene where three or four dogs were lying about the fireside, and impeding her in her work.

5. "*He's as bold as a Lammermoor Lion.*"

A Lammermoor lion is a sheep, and the proverb is applied in a sarcastic way to a boasting and assuming person. "As fierce as a lion of Cotswold," is an English proverb, and bears the same meaning.

6. "*We'll gang a' together, like the folk o' the Shiels.*"

I have heard that *Lammerton Shiels* is the place here referred to. Others say it is *Shiels* somewhere in the Merse, but the name is so common in Scotland, that we have some doubts whether it ought to be admitted as a peculiar proverb of this county. It is, however, very common in the mouths of the peasantry, when any party of them wish to accompany another to their homes from *kirns* and other social meetings.

7. "*Go to Birgham and buy bickers.*"

This is said to a person whom one is desirous to get rid of. Birgham is a small but ancient village on the north bank of the Tweed, a few miles below Kelso. The Scottish competitors for the crown, in the time of King Edward I., met here in 1291 to acknowledge that ambitious king as their supreme lord and master; and hence the place became odious to all true patriots of the Scottish nation, and was associated in their minds with the abominable transaction of those who bartered away the independence of their country for a precarious crown; and it is supposed that this popular saying originated in the contempt with which the common people viewed the ignoble transaction of their superiors.

8. "*We're like the folk o' Kennetside-heads, we hae it a' before us.*"

Kennetside-heads is a farm in the western extremity of the parish of Eccles. The occasion which gave rise to this proverb, is said to have been the following:—A person passing the place on an afternoon, about the end of harvest, found a band of reapers taking their ease by the road-side. He asked them, Why were they resting so long, when they had so much corn to cut? One of the band answered, "It is our kirk day, and we hae it a' before us, before the sun is down,"—meaning thereby, that they had it fully under their command. But when the traveller returned pretty late in the evening, he found the "folk o' Kennetside-heads" still shearing *by moonlight*; and hence the saying is frequently used by the labourers in the time of harvest, in a sort of mock way, to indicate that they need not work too hard, because they have *it all before them*. Or it is applied as a warning to those who are too confident in their own powers, and who are hence rather lax in their exertions—"not to be like the folk o' Kennetside-heads."

9. "*He's father's better, cooper o' Fogo.*"

The village of Fogo, which at one time seems to have been of considerable size, has now dwindled down to a few houses, and all its coopers have become extinct. This proverb is very common in Ber-

wickshire, and is applied to the son who equals or surpasses his father in any handicraft or profession, although it is oftener used in a bad sense. Who the far-famed cooper was, we have no account, but the following rhyming commentary, which I have once or twice heard, so far explains the mystery *why* he was so celebrated.

“ He’s faither’s better, cooper o’ Fogo,
At girding a barrel, or making a coggie,
Touning a stoup, or kissing a rogueie.”

10. “ *Dunse dings a’.*”

For what no one can tell. May it not have originated in consequence of the encampment of General Leslie on Dunse Law, with his 20,000 men, in May 1639? Dunse might then have been said to beat all the country.

11. “ *Ilka bannock had its maikie (equal) but the bannock o’ Tollishill.*”

Tollishill is a farm in Lauderdale, and its bannock was unequalled, because gold was baked in it for the purpose of being conveyed to John, first Duke of Lauderdale, a loyal adherent of Charles II., and remarkable in after times for his political power and rapacity, when he was confined in the Tower after the battle of Worcester, in 1651. The heroine who baked the bannock and conveyed it to her landlord, for which purpose she went up to London, was *Margaret Lylestone*, wife to *Thomas Hardie*, tenant in Tulloshill. There were anciently three farms of Tullos in Lauderdale, and from her abode, by way of distinction, she was called *Midside Maggie*. For further information on this matter, we refer to the late John M. Wilson’s “*Tales of the Borders*,” a tale on the same subject by Miss Margaret Corbett, in *Chambers’s Journal*, No. 146; and to a ballad, entitled “*The Gudewife of Tulloshill*,” by James Miller, author of “*St Baldred of the Bass*.”

12. “ *You’ll hae your ain way like the miller o’ Billymill, although the Merse should sink.*”

What the particular way of the miller referred to was, we cannot learn, but we have heard it (and that only once) applied to those who are particularly headstrong and self-willed. *Billymill* stands upon a small stream in the parish of Bunele, and is a lonely place, quite out of the thoroughfare of any road.

13. “ *You’re like the Miser o’ Reston, you’ll rather be drowned than pay for a theeker.*”

It is said that a person of considerable property, who died in *Reston* about forty years ago, was so parsimonious, that rather than give a few shillings to a thatcher to mend the roof of his house, he allowed

the rain to descend upon him at his own fire-side, only warding it off as well as he could with a large *wecht* and the *girdle*; and hence the saying is applied to those who are excessively niggardly and economical in their habits.

14. "*Ye're like the lady of Bemerside, ye'll no sell your hen in a rainy day.*"

This is a common saying in the south of Scotland.—*Chambers's Popular Rhymes of Scotland*, p. 162.

15. "*In Edencraw, where the witches bide a'.*"

This is a common saying in all the eastern parts of Berwickshire, and is often uttered as an expression of contempt for the place. *Auchencraw*, or as it is usually pronounced, *Edencraw*, is a small decayed village in the south-west extremity of the parish of Coldingham, containing about 200 inhabitants. How the proverb arose, we have no means of ascertaining; but we well remember of an old friendless woman called *Margaret Girran*, dying in an old smoky hut, about twenty-five years ago, on a *very windy day*, and she was said to be the last of the Edencraw witches. It was anciently a popular belief, that when the witches departed this life, there was always a very high wind; and on the day in question, this belief was confirmed beyond a doubt, the wind blowing down the house formerly possessed by James Bonner, author of a work on Bees. It has been supposed that the greater number of the seven or eight unfortunate women, whom Home of Renton, then Sheriff of Berwickshire, some time previous to the Revolution, caused to be burned for witchcraft at Coldingham, belonged to this village, and perhaps if search was made in the proper quarters, the names of those unhappy victims of a dark and superstitious age might yet be discovered. That the women of Auchencraw were suspected, long after the above mentioned period, of exercising the black art, we have the following instance occurring in the Session-records of Chirnside:—In May 1700, *Thomas Cook*, servant in Blackburn (in Billy Myre), was indicted before the Kirk-session of Chirnside "for *scoring* or *scratching* a woman in Auchencraw, above the breath (*i. e.* on the brow), in order to the cure of a disease that he laboured under." Of course he imagined that the woman had inflicted the disease upon him, by her power with the Evil One; and it was believed, if a witch could be cut upon the brow, carving thereon the sign of the cross, that her compact with the devil was instantly dissolved.

16. "*You are like the dead folk of Arsiltown (Earlston), no to lippen to.*"

I know nothing of the origin of this singular saying, but we hear it often applied by the peasantry, in a jocular way, to those whom they are not altogether sure of trusting.

Account of the Produce of the Fishery of Sandstell, from the earliest Information contained in my Father's books, that have been preserved. By
 WILLIAM WAITE, Esq.

Year.	Salmon.	Gilses.	Trouts.	NOTES OF ANY THING REMARKABLE RELATING TO THE FISHERY.
1736	1486	No account.	398	The account of the first of these seasons only comes down to 31st July; the second to 13th August; the remainder lost. No account to be found of Sandstell of 1733-39-40-41, but all these seasons were good in Blakewell.
1737	2694	Do.	400	
1742	1582	300	1002	
1743	1666	606	402	<i>N. B.</i> Sandstell, in 1745, had on the 13th April produced 52 salmon, but her ground was then thought so bad, that the fishermen deserted her and went to Scotland, though I have often heard Mr Lambert say, had they continued, they would have fished as well as usual.
1744	1940	No account.	500	
1745	52	Do.	No account.	
1746	1206	840	960	<i>N. B.</i> Caught in Sandstell, on 10th July 1747, in one tide, 170 salmon, 630 gilses—in all 700 fish.
1747	3836	5150	1030	
1748	7024	2042	634	
1752	4372	560	420	No account of 1749-50-58 to be found.
1753	6386	922	512	
1754	4476	5710	392	
1755	4632	1914	350	<i>N. B.</i> In 1754, caught in Sandstell, in one tide, 300 salmon and 900 gilses—in all 1200 fish.
1756	4558	No account.	634	
1757	1846	Do.	654	
1758	4714	3354	366	In 1757, Hallowstell a great year. Sandstell ground had likely been bad.
1759	5988	3816	122	
1760	8934	1020	106	
1761	4812	1153	128	<i>N. B.</i> 1760. Believed the most plentiful season ever known in the Tweed. A great quantity of salmon sold at 9d., 8d., and one day at 4d. per stone. One flood on a Monday supposed to produce 10,000 salmon.— <i>N. B.</i> In all these years, very few trouts.
1762	8634	2880	446	
1763	6472	2226	592	
1764	11216	No account.	782	<i>N. B.</i> The greatest year that ever was in Sandstell.
1765	17484	Do.	1300	
1766	8538	2486	954	
1767	6552	1688	988	<i>N. B.</i> About this period, the Bull commenced fishing, and had some very great years.
1768	6826	2046	1140	
1769	6006	No account.	376	
1770	8970	Do.	1702	In July 1770, my father died. For years after that, the gilse books either lost or mislaid.
1771	12852	Do.	1144	
1772	8308	Do.	1843	
1773	9238	Do.	3403	<i>N. B.</i> About this period, the hole in the Meadow Haven began to increase, and lowering the beacon rocks for smugglers' ballast,—both certainly injurious to the Tweed, but Sandstell particularly.
1774	3008	Do.	2574	
1775	7176	Do.	2280	
1776	8338	Do.	1544	<i>N. B.</i> In 1782, two most remarkable floods in May, which injured Sandstell grounds excessively, and certainly hurt the Tweed fishing generally.
1777	3736	Do.	808	
1778	2836	Do.	1938	
1779	5374	Do.	2536	Sandstell ground not so good for many years after the Floods in 1782.
1780	5496	Do.	864	
1781	6878	Do.	730	
1782	2904	Do.	258	<i>N. B.</i> In 1787, a great salmon season, but few gilses. Terrot's, and the Tweed generally, much better in proportion than Sandstell.— <i>N. B.</i> In 1787 and 1789, great quantities of salmon in both seasons, but from badness of Sandstell ground, and constant floods, did not get our proportion in either season.
1783	1922	Do.	1346	
1784	2498	Do.	986	
1785	1906	Do.	769	
1786	2800	4400	1224	
1787	3856	640	2558	
1788	1477	4419	1454	
1789	2577	1513	1465	
1790	2498	No account.	No.	

Year.	Salmon.	Gilses.	Trouts.	NOTES OF ANY THING REMARKABLE RELATING TO THE FISHERY.
1791	2732	5318	5828	<i>N. B.</i> 1792. The first good year in Sandstell since the floods in May 1782, but still not in proportion to the river generally.
1792	6900	4111	2336	
1793	2532	4526	5050	<i>N. B.</i> In 1794, a great gilse time, between 3000 and 4000 gilses in one week. A most uncommon absence of fish from beginning of June till end of July, after that great fishing, particularly gilses.
1794	4236	10534	3484	
1795	7380	7046	3499	1795. A great year.
1796	4715	3253	2221	<i>N. B.</i> A great year in the Tweed, but too many floods for Sandstell.
1797	5494	4792	3033	
1798	4640	4801	1726	<i>N. B.</i> This year Sandstell ground still bad, as Terott's fishings more than doubled her. The Bull particularly great—L.500 worth of salmon in one week.
1799	5235	6075	2843	<i>N. B.</i> A most promising year and far advanced, but in August, and to conclusion, ruined with large and constant floods.
1800	2863	5264	1055	<i>N. B.</i> Terott's this year again better than Sandstell in proportion.
1801	4524	15365	2263	<i>N. B.</i> The greatest gilse year ever was in the Tweed. In all our concerns, 50,388 gilses.
1802	3832	2634	1324	<i>N. B.</i> A middling year.
1803	2206	4851	1327	<i>N. B.</i> The worst and scarcest spring fishing ever recollected: almost nothing down to very end of June. Excellent fishing after that, but Sandstell not good. One of the best years in Terrot's.
1804	2660	3342	2312	<i>N. B.</i> Much hurt with floods.
1805	1958	4074	1876	Two poor seasons, but worse in Sandstell than in Terott's &c.
1806	2050	3000	1742	
1807	3048	6356	2192	<i>N. B.</i> Improving, but both seasons hurt with frequent thunder-storms and floods.
1808	4876	4410	2196	
1809	2510	3294	1296	<i>N. B.</i> A tolerable year in Sandstell, but from perpetual floods, the worst year ever known in the Tweed in my time. Lost considerably on the leases.
1810	3080	3975	1719	<i>N. B.</i> Half Blakowell included this year and afterwards.
1811	3798	3154	1674	<i>N. B.</i> A good gilse season.
1812	2219	7682	2653	
1813	3568	6997	3181	An excellent fishing season.
1814	6299	9123	4408	
1815	4944	12442	5453	A capital gilse season.
1816	5108	13464	7306	Good fishing, but depressed prices.
1817	2976	5922	3930	Good in Sandstell compared with other fishings.
1818	4040	7830	4624	

*Summary of Observations of the Barometer, Thermometer, &c. (Made at the Manse of the Parish of Abbey
St Bathans, Berwickshire, Lat. 55° 52' N. Long. 2° 23' W., at the Height of about 450 feet above the Sea.)*

1835. MONTHS.	THERMOMETER.					HYGROMETER. (Leslie's.)					BAROMETER. (At 32° of Fahrenheit.)					Temperature of Spring Water.	Mean Point of Deposition.	Grains of Mois- ture in a Cubic Inch of Air.	Relative Hu- midity.	Rain in Inches.		
	At		Means.	At		Means.	At		Means.	At		Means.										
	X. A.M.	X. P.M.		IX. A.M.	IX. P.M.		X. A.M.	X. P.M.		IX. A.M.	IX. P.M.		X. A.M.	X. P.M.								
January,	36.1	24.2	35.1	34.8	37.3	36.0	10	10	10	10	29.460	29.468	29.464	29.455	29.449	29.452	27.2	.00116	780	1.077		
February,	40.7	36.8	38.7	38.2	41.6	40.4	9	8	9	7	29.045	29.033	29.039	29.041	29.039	29.040	32.2	.00138	836	2.692		
March,	43.3	36.8	40.0	41.7	44.3	43.0	11	5	8	15	29.332	29.396	29.364	29.327	29.351	29.339	41.0	.00147	845	2.642		
April,	47.5	41.5	44.5	46.1	47.9	47.0	23	12	17	21	29.582	29.580	29.581	29.573	29.560	29.566	42.2	.00145	714	0.910		
May,	49.7	43.0	46.3	48.8	51.0	49.9	25	9	17	23	29.310	29.317	29.313	29.316	29.302	29.309	46.3	.00159	743	2.658		
June,	56.4	49.5	52.9	55.0	58.5	56.7	28	10	19	27	29.524	29.533	29.528	29.524	29.511	29.518	45.7	.00208	782	2.018		
July,	58.9	51.8	55.3	57.1	61.5	59.3	29	10	20	29	29.444	29.450	29.447	29.444	29.434	29.439	46.3	.00223	777	1.162		
August,	60.7	54.6	57.7	59.0	63.2	61.1	24	8	16	19	29.438	29.454	29.446	29.437	29.422	29.430	47.0	.00258	835	3.478		
September,	53.4	48.0	50.7	51.5	56.3	53.9	16	4	10	13	29.091	29.053	29.072	29.098	29.058	29.078	46.3	.00215	873	4.033		
October,	45.7	42.1	43.9	43.9	47.3	45.6	11	7	9	8	28.513	28.551	28.532	28.511	28.522	28.517	46.0	.00165	855	4.992		
November,	41.7	40.3	41.0	40.8	41.8	41.3	9	5	7	8	29.362	29.319	29.341	29.365	29.337	29.351	45.7	.00157	872	4.488		
December,	37.0	36.6	36.8	36.4	37.9	37.1	8	6	7	7	29.572	29.585	29.578	29.569	29.561	29.565	45.7	.00135	906	2.413		
Means,	47.6	42.9	45.2	46.2	49.1	47.6	17	8	12	15	19	29.306	29.312	29.309	29.305	29.295	29.300	45.2	.00172	818		
																	Amount for the year,					32.563

Remarks on the Aurora Borealis, as it occurred at Berwick on the Evenings of Tuesday 17th and Wednesday 18th November, 1835. By Mr WILLIAM BAIRD.

IN a paper which I read to the Club this time two years, I there stated that the appearance of especially vivid displays of the Aurora Borealis, seemed generally to have a decided connection with the weather, and that wind, or rain, or both generally, followed the occurrence. The appearances, which I then, with a feeble pen, essayed to describe, I mentioned had been followed by violent storms of wind and rain, and that the disastrous effects of these had been felt on all our shores. In Loudon's Magazine several short notices may be seen of these phenomena, accompanied with journals of the weather succeeding, all of which support the opinion I had also attempted to establish.

Since the time of my last notice, opportunities have again offered of observing these phenomena in this district, and the succeeding storms of wind and rain which have desolated our coasts, have fully borne out the opinion of their intimate connection with the weather. The remarks which I shall now submit to the notice of the Club, corroborative of my former paper, I shall throw together in the form of a journal, kept for a short period about the time of their appearance.

Sunday, 15th November 1835.—The weather was this day remarkably fine and mild.

16th, Weather extremely fine, mild, and calm throughout the day, the sun shining out with all the warmth of a day in spring. Wind westerly.

17th, During the day the weather was fine and mild; wind westerly; a gentle breeze during the day, but increasing a little as evening began to set in. During the evening, the clouds which had obscured the sky during afternoon, partly cleared away, and a fine display of Aurora was observed. I unfortunately did not see them myself this evening but they were described as being very vivid here, and were observed the same night at Cockburnspath, being described there as producing such a degree of light as if the moon were near her full. At Berwick they were observed at times shooting up in pencils of light, while at Cockburnspath they were seen in the form of bright white cloudy-like masses of light, not possessed of much motion. During the display of these phenomena the wind was moderate, blowing from the westward; but about two or three o'clock of the following morning, the 18th, it rapidly increased, and soon blew a gale from the south-west, unaccompanied with rain. As morning advanced it took a north-westerly direction, and at ten A. M. it blew a fierce storm, which continued during the forenoon, but gradually abated about two or three o'clock in the afternoon. Several fishing boats belonging to Coldingham had

gone out early in the morning upon their usual avocations. They were caught in the storm while out in deep water, and were obliged to take refuge from the gale by attempting to run for Eyemouth and Burnmouth harbours. Several of them reached the desired havens in safety; but one poor boat, less lucky than the rest, and manned by a gallant crew of six men, some of them the flower of their village, while struggling with the tempest, was hidden by a mighty wave from the eyes of their comrades, and swallowed up by the roaring ocean. The Aurora of Tuesday night, it appears, was observed simultaneously at great distances from Berwick. At Edinburgh, Aberdeen, Banff, it was seen very vivid, and the storm which succeeded its display, it also appears, has raged all along the north-east coast of Scotland. Every succeeding day brought in from the more distant quarters of the country tidings of still more fatal disasters. At Peterhead, St Comb's, Gardenston, Collin Bay, Johnshaven, Banff, and other places on the coast, fishing-boats, all intent upon their perilous avocations, were caught in the storm, which, veering round from south-west to north-west, took them at unawares, and, in too many instances, at all the places I have mentioned, produced the most fatal results. Many were but too surely swallowed up by the raging sea, while others have been amissing, some of which, it is feared, have shared the same melancholy fate. Coasting-vessels all along the north-east shore have experienced shipwreck, and the most fearful devastation has taken place. Nor did its fury make itself be felt at sea alone—on the dry land houses were unroofed, trees blown down, and tiles and slates driven about by the force of the gale, like chaff or feathers. At Berwick the gale abated about two or three o'clock in the afternoon, decreasing to a moderate breeze, whilst, in the evening, the most splendid display of Aurora took place that I had ever on any occasion witnessed. It seems to have commenced at half-past seven P. M., and to have attained its greatest brightness about eight. At this hour the scene presented by their appearance was magnificent beyond description. An immense concourse of beautiful pencils of light, varying in intensity from the most vivid brightness to a mild effulgence, shot up from the east, north and west, now flickering, then blazing, shortening and lengthening themselves alternately, till they reached the zenith, and there converging together in a flood of light. The beautiful appearance thus presented, was said by one poetic, imaginative spectator, to resemble an angel's wing—but it would require a pen snatched from the plumes of that angel's wing itself, to describe with justice the amazingly magnificent scene that then was unfolded to our wondering and admiring eyes. This truly astonishing display continued visible for some time—then changed its appearance, and during the rest of the evening assumed at intervals almost every possible variety of configuration. At one time the whole sky, even far to the southward, was covered with bright, white, cloudy-like thin masses, in constant motion—now

flickering over the whole heavens, then suddenly withdrawn like a veil from off the sky, but only for a moment, having their places almost immediately supplied by a fresh host in amazingly rapid motion. When watching these bright visitants in their rapid career over the sky, it was almost impossible not to be convinced that the ear could distinctly trace their quick sound as they passed over. The wind, however, was blowing at the same time in short quick gusts, the sea was to be distinctly heard in the distance, and the hum and noise of the town came also by fits upon the ear, so that it was impossible to ascertain, with any thing like precision, whether or not the sound was imaginary, or a portion, as it were, of some of the various noises I have mentioned. At another time, after these fairy clouds had vanished, a bright broad arch of light would form over the northern horizon, with thousands and tens of thousands of short rays proceeding out of its upper edge, disappearing after they had shot up a few degrees, in a narrower arch extending over the other, from whose upper edge longer and brighter pencils flashed up to the zenith. After continuing thus for some time, these arches might be seen themselves in rapid motion, moving with all their bright rays issuing from them, away to the west; a host of short coloured rays at times dancing, and leaping, and skipping along their edges with fantastic motions, well deserving the name so appropriately applied to them, the *Merry Dancers*. Soon after the arches became in motion, they might be observed to be formed altogether almost in the west, but it appeared to me that, though the southern quarter of the sky, at various times during the evening, was more covered with these meteors than I had ever seen before, the arch never moved its western limb farther southward than a point or two beyond due west. Once, while watching this arch in motion, it seemed to stop with one of its limbs about due west, while the other continued still to move steadily on from the north, and, as it shortened the distance between the two limbs, and contracted the space contained within the arch, the centre of the arch rose higher up into the sky, and increased apparently in brightness. This almost circular arch continued visible only for a short time, and was truly beautiful. The arch itself, as I have said, increased in brightness as it rose higher up in the heavens, and continued to shoot out from its upper edge immense quantities of bright rays which converged in the zenith, while it appeared to be bounded on the south-west and north-west by immense pyramidal-shaped pillars of living fire, which shot out directly from the horizon, and extended up to the zenith in huge jets of startling brightness, giving to the imaginative mind the idea of watchful sentinels, waving their swords of flame in protection of their weaker and more timid comrades. The meteors continued visible thus, constantly varying in appearance, till a late hour in morning, having been observed still pretty bright at three o'clock. During the whole time they lasted, they gave out a great

degree of light, and though, at the time of their commencement, it only wanted thirty-six hours of new moon, the night was fully as light and clear as if she had been at her full. At all times, and during every variety of configuration, the stars could be distinctly seen shining through them with scarcely any diminution of their brightness. The brightest exhibitions, during the evening, were very evidently from the westward, and what struck me as remarkable, the greater part of the southern hemisphere at times was covered with them also. The morning of Thursday the 19th was clear, with slight frost; but as the day advanced it became cloudy; the frost gave way, and rain succeeded in the evening. The rain increased as evening advanced, and continued all night, and all the morning of next day, the 20th. In the forenoon, however, it cleared up, and continued fair, though frequently threatening rain, all the rest of the day.

21st, Clouds continued to cover the sky, and collect in great quantities in the forenoon, at 1 p. m. passing into nimbus, which soon extended all over the sky, and descended in continued heavy rain during the whole day. In the evening the wind, which all along had been from the westward, began to rise, and soon increased to a smart gale, with much and heavy rain all night long. The wind fell, and the rain abated in the morning of the 22nd, which commenced fine; but during the forenoon the clouds again collected from the westward. Extensive nimbus again formed, and spread over the whole sky about 1 p. m., and descended in torrents of rain during the rest of the day, and during the whole night. Early in the morning the Tweed was observed, from the previous day and night's rain, to be swollen to top flood, and all the streams were flooded throughout the neighbourhood. As the rain, however, came from the west, it was in the western parts of the country that the greatest damage was done. A reference to the newspapers of the period will shew a constant succession of fatal accidents, where, from the swollen state of the streams, considerable loss of life took place, both men and horses being in many cases swept away and overwhelmed by the torrents. But it was at Greenock that the most fearful devastation took place, and the dreadful event that occurred there during the night and morning of the 21st and 22d, whether considered in the view of the mere damage done to property, or the more frightful loss of human life, will long be remembered in that quarter with feelings of dismay. The very large reservoir which collects the water destined for the supply of the various mills and public works about Cartdyke, and which is situated on high ground about a mile above that suburb of Greenock, was so immensely filled by its overflowing feeders, that the embankments, though said to be 150 feet thick, became no longer able to bear the huge pressure of water, and gave way with dreadful fury. The torrent of water which now escaped, rushed into another dam a little below it, which also gave way, and, increased thus to a frightful extent, bore death and

destruction before it; the older houses and buildings which opposed its course were swept away like gossamers' webs before the morning breeze, and men, women, and children, while warm in their beds and fearing no danger, were in a moment buried in the ruins of their frail tenements, and hurried by the raging torrent along with the wreck of their property, into immediate destruction. Onward with its victims flowed the fearful mass of water, and when it reached the newer and more strongly built houses, it raged and roared at finding itself impeded in its headlong fury, and rose in sheets of spray over the tallest buildings. It still, however, notwithstanding these short checks, continued its path of destruction, and taking some of the streets in its course, plowed up the pavement as if it were a bed of sand, and forcing its way into the lower parts of the houses on each side, swept away their furniture, and committed the most dreadful destruction. Upwards of forty human lives were lost in this fearful night, and some of the most extraordinary and almost miraculous escapes took place that can well be conceived. It is not the object of this paper to give the details of this sad calamity; but it will long be remembered in the neighbourhood of Greenock as one of the most appalling events that has ever occurred there.

23d, The forenoon was fair, but cloudy. Nimbus formed, however, at about 1 p. m., and it rained heavily all the rest of the day and evening.

24th, Was fine and mild all day.

25th, Forenoon fair, but cloudy. Nimbus forming again about mid-day, and considerable rain falling during afternoon and evening.

26th, Forenoon fine and clear. Towards noon cirri began to form aloft, in some places assuming the plumose figure. In afternoon they descended in atmosphere, and gradually condensing became cirro-stratus. In evening the wind rose to a fresh breeze, nimbus formed, spread over sky, and heavy rain took place.

It is unnecessary to continue the Journal farther. The storms and floods which I have attempted to give some idea of in the above pages, will, I think, when taken in connection with such exceedingly vivid displays of the Aurora as I have attempted to describe, fully bear out the opinion which has been so frequently adopted, of their intimate relation with these bright, beautiful, and interesting phenomena.

Habitats for Plants, either not mentioned in Dr Johnston's Flora of Berwick, or rarely met with within its limits. By FRANCIS DOUGLAS, M.D.

ZOSTERA marina. Holy Island.

VERONICA scutellata. Smailholm Bog.

FEDIA olitoria. Stitchell Lynn.

SCHÆNUS nigricans. Learmouth Bog.

SCIRPUS maritimus. Mouth of Warren Water, abundant.

BROMUS secalinus. Field near Smailholm.

HORDEUM murinum. Home Castle, and abundant about Kelso.

PARIETARIA officinalis. Old Walls at Ford, Crookham, Etal, &c.

ANCHUSA sempervirens. Polwarth Church.

ANAGALLIS tenella. Holy Island, near the Snook.

SOLANUM Dulcamara. Hedge, Learmouth.

GENTIANA amarella. At Holy Island. Fl. invariably white.

ŒNANTHE pimpinelloides. Mouth of Warren Water, plentiful,—but with the characters also of *Œ. peucedanifolia*, having linear radical leaflets, and frequently wanting the universal involucre.

JUNCUS cænosus. Holy Island.

EPILOBIUM alpinum. On the sides of College Water, Hen-Hole, Cheviot, sparingly.

VACCINIUM oxycoccus. Yeavinger Bell. Learmouth Gorse.

PYROLA minor. Wood near Smailholm.

DIANTHUS deltoides, var. β With pure white flowers on Nenthorn Hill.

ARENARIA peploides. Bay, Holy Island.

POTENTILLA argentea. Stitchell Lynn.

NUPHAR lutea. Eden, near Mellerstain.

RANUNCULUS Lingua. Banks of Eden, near Mellerstain, with the above.

TROLLIUS europæus. Hen-Hole, Cheviot.

BETONICA officinalis. Bradford Dean, Belford; and Dean at Kyloe.

SCROPHULARIA aquatica. Eden, at Nenthorn.

LEPIDIUM campestre. Lowick Quarries.

COCHLEARIA officinalis. Hen-Hole, Cheviot.

NASTURTIUM terrestre. Lithtillum Loch.

SISYMBRIUM Sophia. Learmouth.

GERANIUM lucidum. Stitchell Lynn; Dryburgh Abbey.

MALVA Moschata. Birgham. Mertoun, with occasional white flowers.

GENISTA anglica. Greenlaw Moor.

ASTRAGALUS Glycyphyllos. Sea-banks near Bamborough.

MEDICAGO sativa. Holy Island Links.

HYPERICUM humifusum. Nenthorn.

- HIERACIUM umbellatum*. Hen-hole, Cheviot.
CARLINA vulgaris. Bamborough Links.
ERIGERON acris. A solitary specimen found on Holy Island, in August 1835.
INULA dysenterica. Holy Island Links. Confined to a small spot. Not in flower either in 1835 or 1836.
CHRYSANTHEMUM Segetum. Fields at Gordon.
LISTERA ovata. Holy Island Links.
 ——— *cordata*. Wood near Smailholm.
EUPHORBIA exigua. Road-side near Smailholm.
TYPHA latifolia. Eden, above Nenthorn. Lithtillum Loch.
CAREX curta. Learmouth Gorse.
 ——— *limosa*. Bog near Smailholm Tower.
 ——— *hirta*. Birgham, with smooth herbage.
ARUM maculatum. Stitchell.
RHODIOLA rosea. Hen-hole, Cheviot.

First Report on the Fauna of Twizell. By P. J. SELBY, Esq.

HAVING commenced, a short time ago, what is intended (when completed) to form a Fauna of Twizell, the following is a list of the vertebrate animals, which have already come under my notice.

MAMMALIA.

- | | |
|---------------------------------|---------------------------|
| QUADRUMANA. | Sorex araneus, Linn. |
| <i>Vespertilionidæ.</i> | fodiens, Gmel. |
| Vespertilio pipistrellus, Desm. | Erinaceus europæus, Linn. |
| emarginatus? Geoff. | |
| Plecotus auritus, Geoff. | <i>Glîres.</i> |
| | Mus sylvaticus, Linn. |
| <i>Feræ.</i> | musculus, Linn. |
| Mustela putorius, Linn. | decumanus, Pall. |
| erminea, Linn. | Arvicola amphibia, Desm. |
| vulgaris, Linn. | agrestis, Flem. |
| Lutra vulgaris, Desm. | Lepus timidus, Linn. |
| Canis vulpes, Linn. | cuniculus, Linn. |
| Talpa europæa, Linn. | |

AVES.

- | | |
|---------------------------|-------------------------------|
| RAPTORES. | Falco tinnunculus, Linn. |
| <i>Fulconidæ.</i> | Æsalon, Gmel. |
| Haliaëtus albicilla, Sav. | Accipiter fringillarius, Vig. |
| Falco peregrinus, Gmel. | Buteo vulgaris, Bechst. |
| Buteo lagopus, Flem. | Regulus auricapillus, Selb. |

Pernis apivorus, Cuv.
Circus rufus, Briss.
 cyaneus, Flem.

Strigide.

Otus vulgaris, Flem.
 brachyotos, Linn.
Strix flammea, Linn.
Ulula stridula, Selby.

INSESSORES.

Fissirostres.

Hirundo riparia, Linn.
 rustica, Linn.
 urbica, Linn.
Cypselus murarius, Temm.
Caprimulgus europæus, Linn.
Alcedo Ispida, Linn.

Dentirostres.

Muscicapa grisola, Linn.
 luctuosa, Temm.
Lanius excubitor, Linn.
Merula viscivora, Selb.
 pilaris, Selb.
 musica, Selb.
 Iliaca, Selb.
 vulgaris, Ray.
 torquata, Selb.

Cinclus aquaticus, Bechst.
Saxicola Œnanthe, Bechst.
 rubetra, Bechst.
 rubicola, Bechst.

Erythaca rubecula, Swain.
Phoenicura ruticilla, Swain.
Salicaria locustella, Swain.
 Phragmitis, Selb.

Curruca atricapilla, Bechst.
 hortensis, Bechst.
 cinerea, Bechst.

Sylvia hippolais Lath. (*rufa*, Temm). *Certhia familiaris*, Linn.
 sibilatrix, Bechst.
 trochilus, Lath.

RASORES.

Columba Palumbus, Linn.
Phasianus colchicus, Linn.

Parus major, Linn.
 cœruleus, Linn.
 palustris, Linn.
 ater, Linn.
 caudatus, Linn.
Accentor modularis, Cuv.
Motacilla alba, Linn.
 boarula, Linn.
Anthus pratensis, Bechst.
 arboreus, Bechst.
Bombycilla garrulus, Bonap.

Conirostres.

Alauda arvensis, Linn.
 arborea, Linn.
Plectrophanes nivalis, Meyer.
Emberiza miliaria, Linn.
 citrinella, Linn.
 schœniculus, Linn.
Passer domesticus, Ray.
Fringilla cœlebs, Linn.
 montifringilla, Linn.
Carduelis spinus, Steph.
 elegans, Steph.
Linaria cannabina, Swain.
 minor, Ray.
 chloris.

Loxia curvirostra, Linn.
Pyrrhula vulgaris, Temm
Sturnus vulgaris, Linn.
Corvus corax, Linn.
 corone, Linn.
 cornix, Linn.
 frugilegus, Linn.
 monedula, Linn.
Pica melanoleuca, Vieill.
Garrulus glandarius, Flem.

Seansores.

Picus major, Linn.
Certhia familiaris, Linn.
Troglodytes europæus, Selb.
Cuculus canorus, Linn.
Crex porzana, Selb.
Gallinula chloropus, Lath.
Vanellus cristatus, Meyer.

Tetrao Tetrrix, Linn.
 Lagopus Scoticus, Selb.
 Perdix cinerea, Briss.

Charadrius pluvialis, Linn.
 morinellus, Linn.
 hiaticula, Linn.

Grallatores.

Ardea cinerea, Lath.
 Numenius arquata, Lath.
 Totanus ochropus, Temm.
 hypoleucos, Temm.
 Scolopax rusticola, Linn.
 Gallinago, Linn.
 Gallinula, Linn.
 Rallus aquaticus, Linn.
 Crex pratensis, Bechst.

Natatores.

Anser ferus, Flem.
 Anas Boschas, Temm.
 crecca, Linn.
 Clangula chrysophthalmos, Steph.
 Podiceps minor, Lath.
 Larus ridibundus, Linn.
 canus, Linn.
 fuscus, Linn.

REPTILIA.

SAURIA.

Lacertidæ.

Lacerta agilis, Flem.

OPHIDIA.

Anguidæ.

Anguis fragilis, Linn.

Serpentidæ.

Pelias Berus, Bonap.

AMPHIBIA.

*Caducibranchia,**Ranidæ.*

Rana temporaria, Linn.
 Bufo vulgaris, Flem.

Salamandridæ.

Triton palustris, Flem.
 aquaticus, Flem.

PISCES.

ACANTHOPTERYGII.

Loricati.

Gasterosteus aculeatus, Linn.

Cobitis barbatula, Linn.

Salmonidæ.

Salmo Trutta, Linn.

MALACOPTERYGII.

Abdominales.

Fario, Linn.

Eriox ? Linn.

Cyprinidæ.

Leuciscus phoxinus, Yarr.

The list of the mammalia, as might be expected, is limited, and offers little for observation. Among the bats, is one I take to be the *Ves. emarginatus*, Geoff., described by Mr Jenyns in his Manual, and considered a rare species. *Sorex fodiens*, though not frequently seen, owing to its retired habits, is pretty common about the brooks and ditches, but its nearly allied congener, the *S. remifer* of Geoff., has not yet been met with. The otter also now rarely occurs; and no recent instance of the badger (*Meles Taxus*) frequenting his former burrows, has for many years past been observed. The ornithological list

exhibits a considerable number of species belonging to the first three orders, particularly that of the Insectores, which may be attributed to the variety of the ground, and the extensive plantations upon the property, so congenial to the habits of the majority of its members. Among the Falconidæ, is the cinereous sea-eagle (*Hal. albicilla*), as I have twice had the gratification of seeing this noble bird wing his way across the fields, on his route from the coast to the higher parts of the country. The honey-buzzard (*Pernis apivorus*) one of our rarest rap-torial birds, has already been noticed and exhibited to the members of the Club. *Bombycilla garrula*, the lonely wax-wing chatterer, I have twice seen at distant intervals; and the *Loxia curvirostra* (common crossbill) is not an unfrequent visitant. The *Picus major* (greater spotted woodpecker) is the only species I have noticed: its visits are short and uncertain, and generally confined to the period of its autumnal migratory movements. The creeper (*Certhia familiaris*), is however abundant, and resides with us the whole year. That delightful songster the wood-lark, *Alauda arborea*, has only once been met with. Among the Grallatores, the *Totanus ochropus* (green sandpiper) and the *Crex Porzana* (spotted crane) are the only species of rare occurrence. In the class Reptilia, the *Anguis fragilis* (blind or slow-worm) is frequently seen in the dens, as is also the common viper or adder of the country, which upon examination I find to be the *Pelias Berus* of Bonaparte, the *Vipera communis* of Jenyns. The red and dark brown varieties are sometimes met with, which in a great measure I believe depend upon the state or age of the epidermis, as well as the sex of the reptile.

Address to the Members of the Berwickshire Naturalists' Club, after the Sixth Anniversary Meeting, held at Norham, September 20th, 1837.
By the Rev. JOHN BAIRD of Yetholm, President.

GENTLEMEN,

CIRCUMSTANCES, which formed only too sufficient an apology for my absence, having denied me the pleasure of meeting you at the last Anniversary of our Club, and of returning you thanks in person, not only for the honour you formerly did me, in electing me to the chair of President ; but for the forbearance also shewn me while I held that office ; I have now only farther to solicit your indulgence, while I endeavour, after the example of my predecessors (and, as I believe, is still expected of me), to take a short retrospect of the doings and discoveries of the Club during the last twelve months, ending the third Wednesday of September last. Before doing so, however, I perceive it has been customary to congratulate the Club on the prosperity which continues to attend us, and I am happy to be able, after a Sixth Anniversary Meeting, to address you in the same cheering language. The success of our experiment, indeed, has far exceeded, I believe, the expectations of the most sanguine of our members. We were among the first, and I believe the very first, in Scotland, to attempt the formation of a society like the present, whose object should be, minutely to examine and illustrate the Natural History and Antiquities of a particular district or locality ; to meet frequently together for this purpose in different places within the appointed limits ; to spend the day in a personal investigation of its various objects of interest ; and to record our observations and discoveries in papers read at our meetings. The design was not more simple than admirable, and it has prospered beyond our hopes. Many interesting discoveries have been made,—much valuable information accumulated,—and several new and important additions have been made to the Flora and Fauna of Great Britain. Our list of Members too, is not only numerous, but includes several names of eminence ; and, what is not the least interesting feature of our Club, we continue, after an existence of six long years, to meet with the same zeal, and with the same anticipations of enjoyment, as we did at our first formation, when our Society possessed all the freshness and interest of novelty,—and it was yet an untried experiment. The harmony of our meetings has scarcely ever for one moment been interrupted ; and we have, at this moment, the same prospect of pleasure and prosperity before us, as we had at the commencement of our Institution. I cannot help thinking, that one of the principal causes of our success, and of the harmony which pervades our meetings, is the short and simple character of our laws and regulations ; if indeed we can be said to have any laws at all : for, certainly, the rules by which we are guided, are rather certain understood principles and feel-

ings, which education, the object which brings us together, or something better than either, has implanted in the bosom of gentlemen, than any complicated or compulsory code of enactments. The motives which induce our attendance are, not the fear of pecuniary penalties, nor of any disgrace attached to non-attendance ; but the pleasure, gratification, and instruction we derive from our meetings,—the pleasure of social intercourse,—the gratification of beholding and admiring the beautiful scenery of nature,—and the instruction, moral and intellectual, which are to be derived from the study of the works of the great Creator, whose goodness, and wisdom, and power, are conspicuous in them all. In the discoveries which are made, we all feel a common interest ; and though all cannot be equally fortunate, the least successful has the same enjoyment as the happy discoverer himself. And though, as we might naturally have expected in so variable a climate as our own, clouds and tempests have occasionally darkened our days of meeting, and some of us have had many a weary mile to travel, yet have we never failed, except, I believe in a single instance, to have a respectable attendance of members.

The contributions which have been made to the Flora and Fauna of the district and country during the past year, have been more scanty than, I believe, during any preceding year of our existence as a Club. This, however has arisen, neither from any lack or decay of zeal among our members, nor from our past discoveries having exhausted the limited sphere of our observation ; for a vast unexplored field still lies before us ; but from the extremely unpropitious weather of the autumn of 1836, and of the spring of the present year,—weather so ungenial and so remarkable for cold in particular, that the oldest inhabitant of the country scarcely remembers a parallel to it. Yet, that our labours and researches have not been altogether in vain, will be seen from the following short notices of our meetings.

Our Anniversary Meeting in September 1836 was at Yetholm, a village, or two small villages, embosomed among the lower hills of the Cheviot. The day was most unlike the season, being one of great beauty, and the excursion, though productive of no discovery of importance, was by no means destitute of interest. Our walk was first over Yetholm Law—a hill cultivated to its summit—down to Yetholm Loch,—a handsome sheet of water of about 40 acres in extent. Here were observed in considerable abundance,—*Ranunculus Lingua*, *Typha latifolia*, *Nuphar lutea*, *Cicuta virosa*, *Scutellaria galericulata*, *Lythrum salicaria*, &c. Linton Loch, or what at least is so called, a few deep, dark, mossy pools of a few yards in diameter, being the only water visible, was next visited. Here, besides the greater number of the plants observed at Yetholm Loch, the *Lycopus europæus*, &c. and a few specimens of *Hieracium denticulatum*, were gathered ; and several insects and larvæ of some rarity were obtained in both situations. Ascending, then, the lofty and classic hills of Wideopen and Crookedshaws, the

scene of the snow-storm in Thomson's "Winter," and memorable from the occasional residence of the poet himself, in a small cottage situated in a little glen on the former hill, we descended into the vale of Bowmont Water. *Mentha gentilis* was gathered in wet ground by the margin of the river near to Primside Mill, and on the roadside *Carduus nutans* sparingly.

The rocks of the district walked over were exclusively trap, the prevailing, almost the only one being the felspar porphyry. Numerous large boulders of the pitchstone porphyry were observed; this rock being known to occur among the lower hills of the Cheviot.

After dinner, and the excellent address of our late President, Sir William Jardine, several other valuable and interesting communications were read. 1. A notice of the Effect of the root of the Monk's-Hood (*Aconitum napellus*) on the Horse, by Mr Henderson. 2. Notice of *Scolopax major* (Great or Solitary Snipe) by Mr Selby. 3. A List, by the same gentleman, of some of the rarer nocturnal *Lepidoptera*, taken during the season at Twizell House. 3. A Notice, by the Rev. A. Baird, of an Ancient Sea-Beach recently exposed by a violent storm on the coast near Dunglass. 5. An Analysis of Lithomarge from Maxton, by Dr Robert Thomson; also an Analysis of Fuller's-earth from the same situation; and some remarks by the same member on *Potamogeton oblongus*. 6. A List of Day-flying *Lepidoptera*, captured during the last summer by Mr M'Laurin, junior. Some other communications were received, but the reading of them was postponed to the meeting of the Club in December.

At the meeting in December, held as usual at Berwick, (for any notices of which I must be chiefly indebted to our Secretary's minutes), a considerable number of members appear to have been present; and though, in consequence of the state of the weather, and other circumstances, the excursion was short, and produced nothing of interest; yet there appears to have been no lack of in-door occupation and entertainment. Several long and interesting papers were read,—one by Mr Henderson, on the Popular Rhymes of Berwickshire; another, by Mr Darling, on the black-turnip Caterpillar; a third by Mr Donaldson, received from Sir Thomas Macdougall Brisbane, entitled "Practical Observations on the Par, by James Kerse, fisher, Bowhill;" a fourth, by the Rev. Mr Parker, from the Rev. Mr Cook, regarding a Skeleton and Stone-Coffin dug up in Chatton church-yard, for which Mr Parker was requested to convey to Mr Cook the thanks of the Club.

The Rev. A. Baird also exhibited a specimen of the Plain Red Mullet taken in a herring-net some months previously on the coast of Berwickshire, by one of the Cockburnspath fishermen. It was a full-grown individual, and may be regarded as the only authentic specimen hitherto taken in the Scottish seas; for, though it has long obtained a place in the British Fauna, its title to be considered as a Scottish fish has hitherto rested on a vague report. A large map of Berwickshire

was presented to the Club, through Mr Donaldson, from Messrs J. and C. Walker, for which Mr Donaldson was requested to return the thanks of the Club. A specimen of the *Pholas crispata*, found sparingly in Berwick Bay, an addition to the bivalve shells of Berwickshire, was exhibited by Dr Johnston; who also announced the following contributions to the Flora of Berwickshire, made by Miss Hunter of Anton's Hill:—

Agaricus granulosus.	Thelephora incrustans.
sulphureus.	Helvella crispa.
peronatus	elastica.
squarrosus.	Peziza tuberosa.
variabilis.	hemisphærica.
Sistotrema confluens.	fructigena.
Thelephora laciniata.	

Of all these *Fungi*, some of which are rare, specimens were shewn, as also of *Agaricus cochleatus*, *Elaphomyces granulatus*, and *Torula antennata*, which the Doctor had himself discovered in plantations about Foulden.

Of the meeting in May at Houndwood, there is extremely little worthy of record; for, though it was a very pleasant one, the day also delightful, and the attendance of members respectable, yet, owing to the exceedingly backward and unpropitious state of the season, nothing new or interesting in any department of Natural History was observed. While some of the members sought the amusement of angling, another party, in a different direction, proceeded first through a thick and tangled bank of natural wood rising above the river Eye, in the hope that it might afford something interesting; but, though the ground seemed favourable, in this they were disappointed. With the same object in view, they next proceeded to thread the mazes of a wooded and romantic ravine, formed by a little streamlet called Atton-Burn. The day and scenery being delightful, there was much enjoyment in the walk; but with the exception of one or two rare insects captured by Mr Selby,* and the discovery of the nest of the Dipper (*Cinclus aquaticus*) on the edge of a little precipice overhanging a deep pool at the bottom of a waterfall, a most inaccessible situation, nothing was found meriting particular notice. *Chrysosplenium alternifolium* was afterwards found growing sparingly on a wet bank by the river Eye, about a mile and a-half above Houndwood; and on the higher wooded

* Mr Selby gives the following List of those taken on this occasion:—

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| 1. Helobia brevicollis. | 6. Pæcilus cupreus. |
| 2. H. Marshallana. | 7. Omasus nigrita. |
| 3. Loricera pilicornis. | 8. Amara lata. |
| 4. Anchomenus albipes. | 9. Harpalus limbatus. |
| 5. Agonum parumpunctatum. | 10. Tachys binotatus. |

banks above the road, large patches of the *Anemone nemorosa* and *Primula veris* growing together in full and magnificent blossom, attracted general admiration.

The geology of the district was very partially observed. The only rocks which presented themselves were the greywacke and greywacke slate, principally the latter, exhibiting its usual variety of colour and structure. The same rocks seem to occupy a very considerable portion of this part of Berwickshire, composing the greater part of the Lammermoor range in the neighbourhood, and extending from thence to the sea-coast.

After dinner a specimen of *Arvicola pratensis*, taken at Twizell, an addition to the quadrupeds of the district, was exhibited by Mr Selby. No papers were read; notwithstanding a most agreeable evening was passed.

The meeting of the Club in June was perhaps the most delightful of the year. A few weeks previous to it, the cold wintry weather we had experienced in the months of spring had been succeeded by the most brilliant summer. There being much moisture in the soil, the warm suns brought forward vegetation in the most rapid and luxuriant manner. Serious apprehensions had been entertained only a short time before, of a general failure of the crops; but a week or two of the splendid weather which followed soon banished all fear on this subject; and we have once more experienced in this instance the truth of the Divine promise, that while the world endures, seed-time and harvest and day and night shall not cease. God has at length crowned the year with his goodness, after we had almost begun to despair that any harvest, with its golden treasures, would gladden our fields.

After breakfast at Dunse, the members proceeded to the appointed scene of the day's excursion, the banks of the Whitadder, in the neighbourhood of Preston Bridge, a description of scenery from which not a little was expected, nor did it disappoint our hopes. While some of the party amused themselves with fishing, the remainder proceeded to examine the banks of the river above Preston Bridge, which they were able to do to the distance of several miles. The day was most beautiful, the scenery interesting, and the vegetation splendid;

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| 11. <i>Peryphus littoralis</i> . | 19. <i>Aphodius prodromus</i> . |
| 12. <i>Pery. tibialis</i> . | 20. — <i>terrestris</i> . |
| 13. <i>Helophorus granularis</i> . | 21. — <i>æreatus</i> . |
| 14. <i>Sitona ulicis</i> . | 22. <i>Quedius picicornis</i> . |
| 15. <i>Sitona spartii</i> . | 23. <i>Gabrius pallipes</i> . |
| 16. <i>Apion</i> — | 24. <i>Rugilus immunis</i> . |
| 17. <i>Phædon tumidula</i> . | 25. <i>Aleochara</i> — |
| 18. <i>Thyamis</i> — | 26. <i>Oxytelus opacus</i> . |

A very rare dipterous fly was also taken. It was found in a small haugh by the side of a rivulet, where potatoes had been grown the preceding June. Four or five specimens were captured. I have not yet ascertained the name. P.J.S.

but though many interesting plants were noticed, no addition was made to the Flora of the county or district.

The cherry and the gooseberry were both found in tolerable abundance on the wild and precipitous side of Stainsheil Hill, a situation which may be regarded as interesting in reference to the question, whether or not these are to be considered indigenous plants. Perhaps, however, the most interesting plant observed during the excursion was the *Littorella lacustris*, growing in great abundance on the side of a pond at Primrose Hill, the second time only the plant has been gathered in Berwickshire. It would be endless, however, to enumerate the other plants observed and admired. Many of those most beautiful, though common plants, but not less beautiful on that account, which adorn our wooded banks and sunny glades, our verdant meadows and marshy grounds, were here scattered in great profusion, *Menyanthes trifoliata*, *Cistus Helianthemum*, *Geranium sylvaticum*, and *G. pratense*, different species of the beautiful genus *Hypericum*, and many others. "But above all," as our Secretary adds in the minutes, "the glorious forest of whins on the side of Stainsheil Hill," then in full bloom, was no doubt a noble sight, and "will long be remembered with delight by those who witnessed it;" nor will it be less memorable on account of the severe penance endured in forcing a painful and thorny passage through them.

But if nothing new was added to the Flora or Fauna of the district by this day's walk, an interesting addition was made to our knowledge of its geology, scarcely any other part of Berwickshire, perhaps, presenting, in so small a compass, so many geological appearances, interesting in themselves, and important to illustrate the geology of the county. As the result of the observations made on that occasion, however, with a more extended geological survey of the neighbouring district, has been promised to be laid before the Club in the shape of a regular paper, it is needless at present to do more than to notice the subject in the most general manner. The prevailing rocks at Preston Bridge, and for about a mile and a half above it, are merely slates, sandstones, and other rocks, apparently belonging to the coal formation;—not that the general aspect of the rocks themselves, which are exceedingly unlike those of the coal formation in other parts of the country, still less any appearance or any probability of coal being found among them, indicate them as belonging to this class of rocks, but the position they occupy with reference to other rocks, which will be noticed immediately, and the difficulty of regarding them as members of any other formation, seem to forbid us from arriving at any other conclusion. After travelling over these strata upwards of a mile above the bridge, in which distance we find them frequently traversed by dykes of claystone, porphyry, and basalt, they are succeeded by what is undoubtedly the old red sandstone formation, and this again, at no great distance, is succeeded by the greywacke and greywacke-

slate, the principal rocks of the transition series. Thus, in the course of less than two miles, the three great formations of Berwickshire may not only be observed, but their junction—the junction especially of the old red sandstone with the greywacke, may be very beautifully and distinctly seen—even more distinctly, if that were possible, than the same appearance at the celebrated Siccar Point. The hill of Stainsheil is a huge mass of a very beautiful rock, the transition granite or sienite, subordinate apparently to the greywacke. I shall not at present, however, farther anticipate the fuller details, which may, ere long, be read to the Club.

The insects captured or observed were neither numerous nor interesting, and the only communication of any importance which was submitted to the Club at this meeting, was a summary of observations of the barometer, thermometer, hygrometer, &c. for the preceding year, by the Rev. Mr Wallace, which, for the fulness and accuracy of its details, called forth unanimous approbation.

At our meeting in July, at the Lamb Inn, near to Haggerston, we were favoured, as at all our preceding meetings of this year, with a beautiful day, and a large party of members and visitors had assembled to enjoy the excursion. There were here two objects of attraction, the sea-coast and Kyloe Crag, and the members were divided in their choice. One party, therefore, took the direction of the former, another of the latter, and fortune smiled upon them both. The former party, in the salt-marshes at Beal, met with in abundance *Scirpus maritimus*, *Artemisia maritima*, *Chenopodium maritimum*, *Poa procumbens*, *Oenanthe crocata*, *Aira aquatica*, and a plant new to the district, *Blysmus rufus*, growing in abundance from four to eighteen inches in height. Returning from the coast, they observed near Kyloe Church *Ranunculus arvensis*, *Solanum dulcamara*, and in Kyloe Dean *Betonica officinalis*, *Carex remota*, *Erythraea centauria*, *Eupatorium cannabinum*, and a rare British species, the *Hieracium molle*.

The other party was not less successful. On Kyloe Crag they observed in great profusion *Thalictrum minus*, *Cynoglossum officinale*; and a plant new to the district, *Asplenium septentrionale*, was gathered in some abundance on the precipitous cliffs, where also, and in the debris below, were seen *Euonymus europæus*, and our familiar friends the holly and honeysuckle. On the moors *Listera ovata* and *Narthecium ossifragum* were gathered, and returning by Fenwick Wood and the village of that name, many of the plants already noticed, gathered by the other party, were observed, besides a specimen or two of *Trifolium officinale*, and of *Vicia cracca*, with pure white blossoms.

The Kyloe Crag is a bold rocky hill, of no great altitude, with a precipice to the west, from which descends a steep slope, composed of the debris of the hill. It is now in great part clothed with wood, and being seen from a considerable distance, forms rather a conspicuous object in the landscape. It is composed of trap, as most of the other

hills and rising grounds in the neighbourhood, and rises through the coal formation, of which class of rocks the surrounding country is composed.

No papers were read at this meeting. Dr Francis Douglas announced the discovery which he had made of *Cladium Mariscus*, in abundance in Learmouth Bog; Dr Johnston of the *Cerastium atro-virens*, on old walls in the immediate vicinity of Berwick; and the Rev. A. Baird of *Adoxa moschatellina*, in Dunglass Dean, additions to the Flora of the district, which, together with *Blysmus rufus* and *Asplenium septentrionale*, discoveries of the day, were gratifying proofs of progress towards completing the botany of the district. Several very fine specimens of fossils (the property of the Rev. Mr Jenkinson of Lowick), from the limestone quarries of this part of the county, were exhibited at this meeting. Dr Johnston added to the catalogue of Berwickshire bivalve shells, *Listera compressa*, *Cardium elongatum*, and *Nucula tenuis*.

Such, Gentlemen, is a brief outline of the transactions of our Club during the past year. I will make no apology for its numerous defects. It may, however, help to recall to your minds some happy days spent amid the fair scenery of nature, and in the study and admiration of some of the beautiful productions of the Almighty and Beneficent Creator, who called this universe at first into existence, and who still preserves it by the word of His power. "Great and manifold are His works: in wisdom has He made them all." "All His works praise Him." They display His glory: they proclaim His goodness. They invite us to examine them, and it is an employment most suitable to man, the tongue of this mute but lovely creation, which requires his intelligent services to make them speak His praise.

List of Members, continued from p. 106.

Rev. William Thomson. June 21. 1837.

Contributions to the Flora of Berwickshire, &c.

BLYSMUS *rufus*. Salt-marshes at Beal, abundant.

ASPENIUM *septentrionale*. Kyløe Crags.

CLADIUM *Mariscus*. Learmouth Bog, abundant.

CERASTIUM *atro-virens*. Old walls in the neighbourhood of Berwick.

The Popular Rhymes of Berwickshire ; to which are added, a few Illustrations. By Mr HENDERSON, Surgeon, Chirnside.

PERHAPS there are few counties in Scotland which possess so many rhymes of a popular nature, as that of Berwickshire. Whether it be owing to the circumstance that "Thomas the Rhymer" was a native of this district, and to whom the authorship of several of these rhymes is attributed,—or whether the people of the Merse are in general disposed to encourage this species of ancient lore, we will not waste time in a vain endeavour to determine. The fact of itself is sufficiently obvious from the following collection, and perhaps it might still be enlarged. The memory of "Thomas the Rhymer" is still highly honoured in his native county, and the people hitherto have placed undoubted confidence in his prophetic enunciations, although these are certainly now beginning to be numbered among the "wreck of things which were."

As Sir Walter Scott, in his "Border Minstrelsy," &c., has, with his usual pleasing and happy mode of illustration, brought together all the facts that can now be discovered of the Minstrel of Ercildoune, it would be superfluous for us to enter here into any discussion relative to the history or merits of that singular being, who lived so long with the Elf Queen (according to rhyme and tradition), and who yet "drees his weird" in Fairy land. All that we have set ourselves to do is to collect, into one place, all the popular rhymes connected with this county, as far as we are acquainted with them, and append thereto such notes as an explanation of them seems to demand; and if we can hereby be the means of preserving these curious relics of a former day from falling into utter oblivion, the little trouble which we have taken in collecting them will be amply rewarded.

In the first place, we shall introduce those Rhymes which have been for many generations attributed to "True Thomas," and then add the others, which are unclaimed by any author.

1. "The hare shall kittle on my hearthstane,
And there never will be a Laird Learmont again."

Thomas here prophesies the ruin of his own house. It appears that he had granted his property to the Hospital of *Soltra*, and that none of his descendants ever after inherited his patrimony at Earlstoun. About a century ago, it is said, that a hare actually took up her residence in the "Rhymer's Tower," and produced her young upon the hearthstone of the dilapidated tenement. About this time a person of the name of Murray inhabited this ancient edifice. According to Chambers he was "a kind of herbalist, who, by dint of some knowledge in simples, the possession of a musical clock, an electrical machine, and a *stuffed alligator*, added to a supposed communication with Thomas

the Rhymer, lived for many years in very good credit as a wizard." * The person here so ludicrously introduced appears to be no other than Mr Patrick Murray, surgeon in Earlstoun, who details a case of an "Uncommon tumour of the belly, and a dropsy cured," in the "Medical Essays and Observations, by a Society in Edinburgh." vol. vi. p. 133, and published in 1747. The ruins of the Rhymer's Tower may still be seen near the Leader, at the west end of the village of Earlstoun, and a stone in the wall of the church bears the following inscription—

"Auld Rymer's race
Lyes in this place."

2. "This thorn tree as lang as it stands,
Earlstoun shall possess a' her lands."

This Rhyme was very popular about Earlstoun some years since. The tree referred to was a very large one, and stood near the east end of the village. It was blown down by a high wind during the night in the spring of 1821. The lands, originally belonging to the community of Earlstoun, were from time to time alienated by the magistrates, till there is scarcely now an acre left. What gave additional weight to the prophecy was, that, at its fulfilment when the tree fell, "the greater part of the shopkeepers in the town happened to be then, on account of a tissue of unfortunate circumstances, in a state of bankruptcy." †

3. "A horse sal gang on Carrolside brae,
Till the girth gaw his sides in twae."

This refers to some period of desolation in the history of our country, which we fondly hope has been fulfilled long since. *Carrolside* lies on Leader Water, and is the property of an enterprising proprietor, James Home, Esq., who has much improved and ornamented his estate, so that the former sterility of *Carrolside Braes* is no longer proverbial.

4. "There sal a stane wi' Leader come,
That'll make a rich father, but a poor son."

The small river Leader, of classic celebrity for its "*sweet haughs*," and the "Homes that dwelt on Leader side," takes its rise near the quarry, which supplies the district of Lauderdale with lime, and the prophecy is supposed to refer to those agricultural improvements which have in part resulted from the use of lime; the "*stane* that came wi' Leader," which in many instances enriched those who were the first improvers, but which also unfortunately engendered an

* Chambers' Popular Rhymes.

† Chambers.

expensive style of living in their immediate successors, which led to their ultimate ruin.

5. "Vengeance ! vengeance ! when ? and where ?
Upon the house o' Cowdenknowes, now and evermair."

The proprietors of Cowdenknowes were in the days of the Covenanters, of a persecuting disposition, and several traditional stories are related of their cruelty ; hence these lines are often in the mouths of the common people to indicate that vengeance will yet come upon that house, for the evils which it inflicted on the godly in former times. *Cowdenknowes*, so celebrated in song for its "bonny broom," lies near the village of Earlstoun, and is the property of Professor Home of Edinburgh. Part of the present mansion-house is very old, and in this part of it the unfortunate Queen Mary lodged for a night or two. We observed that this estate was lately advertised for sale.

6. "Betide, betide, whate'er betide,
There'll ay be a Haig in Bemerside."

The ancient family of Haig have been in the possession of *Bemerside* for many hundred years. "The grandfather of the present proprietor of *Bemerside* had twelve daughters before his lady brought him a male heir. The common people trembled for the credit of their favourite soothsayer. The late Mr Haig was at length born, and their belief in the prophecy confirmed beyond a shadow of doubt."*

7. "At *Threeburn Grange* on an after day,
There sall be a lang and bludy fray ;
Where a *three-thumbed* wight by the reins sal hald
Three kings horse baith stout and bauld,
And the *Three burns*, *three days* will rin
Wi' the blude o' the slain that fa' therein."

Thirty years ago this rhyme was very popular in the east end of Berwickshire, and about the time of the French Revolution a person of the name of Douglas was born in the parish of Coldingham, with an excrescence on one of his hands, which bore some resemblance to a third thumb. Of course the superstitious believed that this was to be the identical "three-thumbed wight" of the Rhymer, and nothing was looked for but a fearful accomplishment of the prophecy. *Threeburn Grange*, or *Grains*, is a place a little above the Press, where three small rills meet and form the water of Ale.

We now proceed to another class of Rhymes, the most of which are still floating about among the peasantry.

* Minstrelsy of the Scottish Border, vol. iv. p. 150

8. "I stood upon Eyemouth fort,
 And guess ye what I saw,
 Fairneyside and Flemington,
 Newhouses, and Cocklaw;
 The fairy folk o' Fosterland,
 The witches o' Edencraw,
 The bogle bo' o' Billy Myre
 Wha' kills our bairns a'."

It would be a useless waste of time to form theories and conjectures as to the origin of the above Rhyme, for nothing certain is known concerning it, but that it has been in circulation for time immemorial. Were a person at the present day to stand upon the site of *Eyemouth fort*, with the expectation of seeing all the places, not to say persons, enumerated in the Rhyme, he would certainly be disappointed, as from its situation it is impossible to see several of the places named. *Fairneyside*, *Flemington*, and *Cocklaw*, are farm places in the parish of Ayton. Of *Newhouses* we know nothing, and there is no place, we believe, in the neighbourhood now known by that name. *Fosterland* was an old farm place, its site, like many other old steadings, being marked out by a few ash trees near the eastern extremity of the parish of Buncle. A small stream which rises on the moor, above that range of hills called Buncle Edge, is still called Fosterland burn, and is one of the numerous rills that discharges itself into Billy Myre. On the east side of this stream, where its banks are steepest, there formerly existed an extensive British encampment, the traces of which have been nearly obliterated of late years by the operations of the plough. The banks of this stream formed a favourite haunt of the fairies in bygone days, and I once knew an old barn-man, by name David Donaldson, who, although he never saw one of these aerial beings, constantly maintained that he had frequently heard their sweet music, in the silence of midnight, by Fosterland Burn, on the banks of the Ale, and on the *Pyperknowe*.* *Fosterland* is said to be a contraction of Foresterland, the name being derived from the forester of Buncle wood, who had his dwelling here, when all the hill side, from the Whitadder on the west, to this place, was covered with oak and hazel.

Of the witches of *Auchencraw* or *Edencraw*, we have not been able to glean many particulars. We have heard, indeed, one or two other rhymes regarding them, which would shew that, among other things, they delighted in horrid and wicked transactions; but the lines are hardly such as to be fit for hearing.

* *Pyperknowe*, so called from the pipings of the fairies heard on it, is a large knoll lying on the south bank of Billy Myre, behind the present farm-house of *Causewaybank*. It consists principally of gravel, and less than twenty years ago it was covered with a luxuriant crop of broom. It is now cultivated.

With regard to the last mentioned personage in the above rhyme, it is only necessary to say, that the passage over *Billy Myre*, between *Auchencraw* and *Chirnside*, was long infested with a ghost, the "Bogle bo'" of the Rhyme, which bore the cognomen of "Jock o' the Myre."

9. "The Rye kail o' Reston
 Gar'd a' the dougs dee;
 The browster gied us a' a gliff
 Wi' his barley bree,
 And gar'd Meg o' the Gurl hole
 Awa' wi' Bawtie flee."

This rhyme has been often confounded with one of those alluded to. We are convinced, however, that it is altogether distinct from it, and refers to a totally different subject. It is, however, apparently imperfect. The village of West Reston is pleasantly situated upon the south bank of the Eye, in the parish of Coldingham, and contains between two and three hundred inhabitants. In old time it was the seat of a baronial castle, and a chapel dedicated to *St Nicolas*, to which the beneficent *Davidde Quixwood* granted a yearly allowance of some *harts* from his territory in Lammermoor. The disaster to the dogs, which the rhyme relates, may have been caused by diseased rye, or rye infected with the *Secale cornutum*. The latter part of the rhyme is rather obscure. It is probable that the person indicated by "Meg o' the Gurl hole" shared the same fate of the dogs, as *Bawtie* is well known to be a sort of generic name for a colly or shepherd's dog, among the peasantry of Scotland. There is still a house in Reston known by the name of "the Gurl." What is the meaning of the term we know not, and a field on the farm of Greenhead, in the immediate neighbourhood of the village, is still called "the Browster butts."

10. "St Abb, St Helen, and St Bey,
 They a' built kirks whilk to be nearest the sea.
 St Abb's upon the nabs,
 St Helen's on the lea,
 St Bey's upon Dunbar sands
 Stands nearest to the sea."

"St Abb or St Ebba, St Helen, and St Bey, were, according to the country people, three princesses, the daughters and heiresses of a king of Northumberland, who being very pious, and taking a disgust at the world, resolved to employ their dowries in the erection of churches, and the rest of their lives in devotion. They all tried which should find a situation for their buildings nearest to the sea, and *St Bey* or *St Ann* succeeded, her church being built upon a level space, close to the water mark; while *St Abb* placed her structure upon the points or *nabs* of a high rock overhanging the German Ocean, and *St Helen*

pitched hers upon a plain near, but not exactly bordering upon the shore. It is obvious that the situation of these churches suggested the popular belief.* There are now no remains of St Bey's chapel: the ruins of St Helen's are still conspicuous in the parish of Colbrandspath, and the church-yard surrounding them is still used as a burial-ground; but scarcely a vestige of St Abb's remains on the high and lonely point, to which she has bequeathed her name, and not a single grave-stone is now to be seen raising its grey head from among the nettles and thistles which cover the deserted spot, although some aged people remember to have seen it used as a place of sepulture about sixty years ago.

11. "Grisly Draeden sat alane
By the cairn and Pech stane;
Billay wi' a segg sae stout,
Says—'I'll soon turn Draeden out'—
Draeden leuch, and stalk'd awa,
And vanish'd in a babanqua."

This rhyme, which I picked up when a boy from an old man (David Donaldson, referred to above), who possessed a rich collection of old sayings, songs, and rhymes, which I never heard any where else, evidently relates to a large cairn which was situated about half-way between two streams (Draeden and Billyburn), on the farm of Little Billy, in the parish of Buncle. The cairn was surrounded, except on the south-west side, by a circle of large whin stones, many of which would have weighed several tons. At a distance of about 200 yards to the east of this cairn stood a large block, of a reddish sort of granite, which the old man already mentioned used to call "The Altar." The cairn is now removed, but this stone still stands in its original situation. It is probable that the circle of stones surrounding the cairn had constituted, in remote times, a place of Druidical worship; and it is also probable that the small stream, a little to the north of the site of the cairn, derives its name, *Draeden*, from this circumstance; the affix *draed* being similar in sound to *Druid*, and *den*, a dean or vale—The Druid's Vale. When a moss which skirted this stream, was begun to be drained about twenty years ago, many pieces of oak were dug out; and I recollect of being shewn, near its northern extremity, a quagmire or *babanqua*, with a slit or opening in the middle of it, on which no grass or any other plant grew, owing to the constant oozing of the water from its bottom, into which, it was said, a horse and his rider had sunk, and were never more seen. This story rests upon tradition only; but I have seen places of this description, into which, if a person had sunk, he would have been in imminent danger of losing his life; but, since the incalculable improvement of draining commenced, few of

* Chambers' Popular Rhymes, p. 45.

these shaking quagmires are to be seen in this part of the country. It is probable, I think, that this curious rhyme has some distant allusion to the introduction of Christianity into our island, to the discomfiture of a dark and horrid superstition, which formerly held in bondage the souls and bodies of our Pagan progenitors.

12. "Huntly wood—thy wa's are down,
Bassendean, and Barrastoun;
Heckspeth wi' the yellow hair,
Gordon gowks for ever mair."

"The people of *Gordon* were recently a very primitive race; some of them having lived in the same farms from father to son for several centuries. It was perhaps on this account they were stigmatized as the 'gowks o' Gordon' in the above popular rhyme."—*Chambers*. The other places mentioned in the rhyme lie in the neighbourhood of Gordon, but we know not to what circumstances the rhyme refers. In fact, it is a rhyme without any obvious meaning—a *rhyme without a reason*.

13. "The hooks and crooks o Lambden Burn,
Fill the bowie,* and fill the kirn."†

Lambden is in the parish of Greenlaw, where there was anciently a chapel. The rhyme relates to the fertility of the banks of "Lambden Burn," remarkable for its many sudden turnings and windings. It is a tributary of the Leet.

14. "Bughrig and Belchester,
Hatchet-knows and Darnchester,
Leetholm and the Peel:
If ye dinna get a wife
In ane o' thae places,
Ye'll ne'er do weel."

The places enumerated in this rhyme are all within four or five miles of Coldstream. The rhyme should be widely disseminated, for the especial benefit of all bachelors and widowers.

15. "Little Billy, Billy Mill,
Billy Mains, and Billy Hill,
Ashfield, and Auchencraw,
Bullerhead, and Pepperlaw,
There's bonny lasses in them a."

The first five places enumerated in this rhyme are in the parish of Buncle. *Bullerhead* and *Pepperlaw* lie in the parish of Chirnside.

* *Bowie*—a wooden shallow vessel for holding milk.

† *Kirn*—a churn.

About forty years since, all these places were separate farms; but *Little Billy*, *Billy Hill*, *Ashfield*, *Bullerhead*, and *Pefferlaw*, exist now only in name, their farm-houses and cottages being levelled with the soil; and the rhyme is worth preserving, if it was for no other purpose but to keep the *names* from perishing also.

16. "Hutton for auld wives,
 Broadmeadows for swine,
 Paxton for drucken wives,
 And salmon sae fine.
 Crossrig for lint and woo',
 Spittal for kail,
 Sunwick for cakes and cheese,
 And lasses for sale."

This rhyme was taken down only a few weeks ago, from the recitation of a girl of eight years of age in Chirnside. All the places mentioned are in *Hutton* parish; but whether they are *now* famous for the articles enumerated in the rhyme, we have no means of ascertaining.

17. "I, Willie Wastle,
 Stand firm in my Castle,
 And a' the dogs in your town,
 Will no pull Willie Wastle down."

This is said to have been sent by T. Cockburn, Governor of Home Castle, as an answer to a summons of surrender by Colonel George Fenwick, under the Protectorate of Cromwell, in 1650. It is very popular among boys, who repeat it in a sort of game.

Notice of an Ancient Sea Beach, near Dunglass. By the
 REV. ANDREW BAIRD.

EVERY one now present must remember the tremendous gale of the 17th February last, a gale which raged with great fury throughout a large extent of Scotland, but which was felt nowhere more severely than on the coast of the parish of Cockburnspath and its neighbourhood. The wind being from the north-east, and the moon about full, a very high tide was the consequence,—the highest, it was alleged, which had been known for half a century. The effects of this extraordinary tide are still very visible in many parts of the coast; but nowhere, as far as I am aware, was a more curious or interesting disclosure made by it than on that part of the coast betwixt the mouths of Dunglass Dean and Billsdean, immediately on the confines of Berwickshire. This was a bed or deposit of gravel, about four feet in

thickness, mixed with shells, bones, &c., and firmly cemented by calcareous tuffa. It occurs at the base of a lofty and precipitous bank, the lower half of which is moist, and covered with a thick coarse turf, on the removal of which, by the unusual violence and height of the waves on the day alluded to, the appearance which I am now about to describe was opened to view. All that has been laid bare of this curious bed or deposit is about fifty feet in extent; and it occurs at a distance of about the same number of feet from the present high water mark, the base of it being about twelve feet above the highest present level of the sea. It is composed of the same general fragments of rocks which form the present sea-beach; and the imbedded shells are the same as those which are still most abundant on that part of the coast. On examining this bed, the conclusion seems at once to force itself on the observer, that it has at one period, and that for a considerable length of time, been subject to the influence and action of the waves: in other words, that it is neither more nor less than an ancient sea-beach; and having arrived at this conclusion, the interesting question which next suggests itself is, Has the sea receded, or has the land risen, so as to account for the elevation of this gravelly bed above the present level of the ocean? a question which, in the present state of geological science, and especially when other ascertained facts regarding the same coasts (the Firth of Forth at least) are taken into consideration, it will not, perhaps, be difficult to answer. From these facts, the plain and natural reply seems to be, that the land has risen on this part of the coast, though how long it may be since this change took place between the relative level of sea and land, it is not so easy to determine. From several circumstances, however, it would appear to have been recent, *i. e.* after the district was inhabited by the same animals, terrestrial as well as marine, which now exist in it. The shells, as already mentioned, included in the cemented gravel, are all of presently existing species; and the bones which were found in it appear to be equally recent. Several of these bones I picked up in company with D. Milne, Esq., who, on shewing them to well known anatomists in Edinburgh, ascertained that they belonged to the common cow or ox, but a variety greatly smaller than that which is now to be seen in the Lowlands of Scotland. Some of these bones, I may farther mention, appear to have belonged to a species of the genus *Cervus*. On a subsequent occasion, I found various and well defined teeth; from all which facts, the discovery of this ancient sea-beach may be regarded as one of no small interest, being one of the few facts yet recorded or observed, which would tend to prove that the present race of land animals existed before the change of levels took place. To establish the correctness of this inference, one thing seemed to be especially desirable, *viz.* to ascertain whether these bones were actually imbedded in the gravelly mass, or merely adorning to the surface of it, as, in the latter case, very little information regarding

the point now alluded to could be drawn from their occurrence. I have since ascertained, however, from personal examination, that they were imbedded (many of them in the very centre of the mass), which, combined with other appearances which the limits of a notice will not allow me to detail, tends to confirm the idea, that the elevation of this part, at least, of the coast of Berwickshire, must have taken place at a comparatively recent period.

I may farther mention, in connection with this subject, that on the coast of Fife, immediately opposite to this, a rise of the land, to the height of about fourteen feet above the present high water mark, has recently been observed by an eminent geologist; and, probably, the appearance I have now attempted to describe may be considered of the same date. The subject, however, may be recurred to, and more fully.

A List of the Pulmoniferous Mollusca of Berwickshire and North Durham.
By GEORGE JOHNSTON, M. D.

MOLLUSCA.

CLASS.—GASTEROPODA, *Cuv.*

ORDER—PULMOBRANCHIA, *Blainv.*

FAMILY I.—LIMACIDÆ.

1. ARION ATER, *Flem.* The *Arion circumscriptus* is a variety or immature state of this species. Common.
2. ARION SUBFLAVUS. Woods and shaded places. Frequent.
3. LIMAX CINEREUS. Frequent.
4. LIMAX CELLARIUS, *Lister.* In wine cellars in Berwick.
5. LIMAX AGRESTIS. Very common, and in some years very destructive to early crops.
6. LIMAX BRUNNEUS, *Drap.* This differs from every variety of *L. agrestis*, in its darker colour, its colourless mucus, in the abrupt termination of the tail, in the position of the shield, which is nearly central when the animal is fully extended, and in the size of the shield, which is as long as the posterior half of the body; nor is there any keel on this part. It inhabits shady woods, and is comparatively rare. As a native, its discovery is due to my friend, Mr J. Alder of Newcastle, who pointed out its peculiar characters to me on specimens taken in Dunglass Dean.

FAMILY II.—HELICIDÆ.

7. VITRINA PELLUCIDA. Not uncommon. Our Berwickshire shell is smaller, and less tinged with green than specimens from England. It is probably the *V. Mulleri* of Jeffreys.

8. *Succinea Amphibia*. Common. A small variety, about three-tenths of an inch long, is also common in Berwickshire. It seems to be a perfect shell; and, in the places where it abounds, the larger shell is not found.
8. *Succinea gracilis*. Amongst hypna in spongy places, or in trickling rills. Sea banks below Redheugh, and about the coves at Cockburnspath.
10. *Helix aspersa*. Common.
11. *Helix arbustorum*. Common near Berwick, and in the eastern parts of the county.
12. *Helix nemoralis*. Very common. The numerous variations in colour to which this species is subject, may be classified thus :
 1. Pure yellow or cream-coloured.
 - A. Yellow banded with brown.
 - a. Bands narrow.
 - b. Bands broad, often confluent.
 - c. Bands mottled.
 - II. Uniformly flesh-coloured.
 - B. Flesh-coloured, banded with brown.
 - a. Bands narrow.
 - b. Bands broad, often confluent.
 13. *Helix hortensis*. Not uncommon.
 14. *Helix trochulus*.—*H. fulva*, *Turt.* In woods frequent.
 15. *Helix scarburgensis*. In the dean at Twizell House. I have a single small specimen found near Berwick.
 16. *Helix aculeata*. Pease Bridge dean. Rare.
 17. *Helix fusca*. In Dunglass and Pease Bridge deans abundant, where it was shewn me by Mr J. Alder.
 18. *Helix granulata*, *Alder*.—*H. hispida*, *Mont.* Not uncommon.
 19. *Helix hispida*, *Jeffreys*, in *Lin. Trans.* xvi. 388. Not uncommon under stones in shaded places.
 20. *Helix concinna*, *Alder*. Frequent.
 21. *Helix caperata*.—*H. striata*, *Drap.* Common.
 22. *Helix ericetorum*. Roadside between the village of East Ord and Longridge Lodge. Plentiful in several spots.
 23. *Helix nitidula*. Common.
 24. *Helix cellaria*. Not uncommon.
 25. *Helix alliaria*. Common.
 26. *Helix lucida*. The specimen of this shell in my collection was found in the Hirsell plantations. I believe it to be rare in our district.
 27. *Helix radiatula*, *Alder*. Frequent.
 28. *Helix crystallina*. In moss. Not rare.
 29. *Helix pygmæa*. In a boggy piece of ground, on the banks between Redheugh and Fast-Castle, Mr Alder and G. J.
 30. *Helix rotundata*.—*H. radiata*, *Mont.* Common.

31. *HELIX PULCHELLA*. Langton Woods. Apparently rare in Berwickshire, where we have seen only the smooth variety.
32. *HELIX PURA*, *Alder*. On the sea banks between St Abb's Head and Fast-Castle. Rare.—The *Helix ericetorum* occurs abundantly on a bank at the roadside between Spindleston and Gloweroer-him, and *H. virgata* on the links at Bamborough Castle; but these localities are without the limits to which this catalogue is confined.
33. *BULIMUS OBSCURUS*. Rare. Dunglass dean, in the dean at Twizel Bridge, and at Twizell House.
34. *BULIMUS LUBRICUS*. Frequent.
35. *BALEA FRAGILIS*. Frequent, though rarely abundant in any one place. On Smailholm Tower, plentiful.
36. *CLAUSILIA RUGOSA*. Common.
37. *PUPA UMBILICATA*. Common.
38. *PUPA MARGINATA*. Holy Island, plentiful; Spittal Links; on the shore at the mouth of the Pease-Burn.
39. *PUPA ANGLICA*. Dunglass dean, Mr Alder; under stones at the mouth of the Pease-Burn; sea banks between Ross and Lamberton Shields.
40. *VERTIGO PALUSTRIS*, *Turt.*
41. *VERTIGO SUBSTRIATA*, *Jeffreys.*
42. *VERTIGO PYGMÆA*, *Drap.* These three species were found together in a piece of boggy ground, on the banks between Redheugh and Fast-Castle. Mr Alder and G. J.

FAMILY III.—AURICULIDÆ.

43. *CARYCHIUM MINIMUM*. Under decaying leaves in woods, and in moist places, not uncommon.

FAMILY IV.—LYMNEIDÆ.

44. *PLANORBIS VORTEX*. Not uncommon.
45. *PLANORBIS CONTORTUS*. Not uncommon.
46. *PLANORBIS ALBUS*. Common.
47. *PLANORBIS LÆVIS*, *Alder*. Holy Island Lough.
48. *PLANORBIS NITIDUS*. Rare. Coldingham Lough.
49. *PLANORBIS IMBRICATUS*. Rare. Near the mouth of the Whiteadder.
50. *LIMNÆA STAGNALIS*. In a small pond on Halydown Hill, and in a pond at the base of the hill near the field grieve's house.
51. *LIMNÆA PEREGRA*. Very common.
52. *LIMNÆA PALUSTRIS*. Not uncommon.
53. *LIMNÆA FOSSARIA*. Frequent.
54. *PHYSA FONTINALIS*. Common.
55. *PHYSA HYPNORUM*. Rare. In a ditch below Jourdan Field, near Dunse, Mr W. Dunlop.
56. *ANCYLUS FLUVIATILIS*. Frequent.
57. *ANCYLUS LACUSTRIS*. Rare. In small ponds near the mouth of the Whiteadder. Coldingham Lough, Mr Alder.

Notice of the Effect of the Root of Monkshood (Aconitum Napellus) on the Horse. By Mr HENDERSON, Chirnside.

FOUR years ago, I dried and powdered for some purpose a quantity of the root of this plant, and having kept about half an ounce till I imagined it quite inert, I threw it out upon the top of a wall, near which I used frequently to tie my pony. In this situation, she one morning licked up about one-half of it when I had occasion to ride about eight miles. Ere long, however, she began to chew incessantly, and saliva to flow from her mouth in great abundance. Her debility also became such, that she could scarcely carry me, and she was covered with a profuse perspiration. After reaching with difficulty the place appointed, the salivation continued for six hours; not less than three gallons of a watery and frothy mucus being discharged from her mouth. After this it gradually subsided, and I rode her home in the evening, apparently nothing the worse, though at one time I had given her up as lost. The situation admitted of no other remedy than a little oatmeal and water; though perhaps a little linseed or salad oil might have been of advantage, had it been tried. While suffering under the poison, she would neither eat nor drink; nor did she taste anything till the day after. No permanent ill effects, however, followed. If properly administered, might not this root be of service in some diseases of horses, such as colds, &c., in promoting a free discharge from the salivary glands? Might it not also be tried in the severe disease called glanders?

Analysis of Fuller's Earth from Maxton. By ROBERT D. THOMSON, M.D.

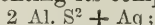
THIS mineral is found in round masses larger than the fist, in the bed of a stream at its junction with the Tweed near Maxton, imbedded in claystone porphyry, spec. grav. 2.394. Before the blowpipe, with nitre, carbonate of soda, and salt of phosphorus, it fuses into an opaque mass. With borax, fuses into a transparent bead,—pale amber-coloured when hot, colourless when cold. *Colour*, yellowish-white or chalky. *Fracture* earthy, soft, soiling the fingers; scratched by the nail, tuesite and gypsum. Adheres to the tongue like Halloysite. Contains crystals of decomposing felspar interspersed through the mass. Its constituents I found to be,

Silica,	.	57.105
Alumina,	.	31.850
Magnesia,	.	2.615
Water,	.	7.280

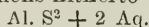
98.850

Now, this is equivalent to silica, 4 atoms; alumina, 2 atoms; water, 1 atom.

Hence the formula representing its composition is,



the formula for those specimens hitherto examined being



Berthier has included a mineral possessing the same composition under Halloysite, and another under Kaolin, as exhibited in the following table :

	Halloysite, Fahlun.	Kaolin, Normandy.
Silica, .	46.8	50.
Alumina, .	26.7	28.
Peroxide of Iron, 5.		5.5
Magnesia, .	0.4	.7
Lime, .	3.	5.5
Potash .		2.2
Water, .	13.5	9.5
	— 95.4	— 101.4

Berthier considers these two specimens as affording instances of felspar in different states of decomposition ; and although he adduces no circumstances which tend to confirm his supposition, yet it is possible his conjecture may be correct. I could observe no fact, however, which could give countenance to the idea, that Tuesite, or Fuller's earth, was in any way connected with felspar in masses.

Analysis of Lithomarge from Maxton. By ROBERT D. THOMSON, M.D.

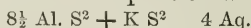
For this specimen, as well as for the preceding, I am indebted to the kindness of the Rev. John Thomson of Maxton. It occurs in veins in the old red sandstone near the school. It is a soft yellowish substance. It is smooth, yielding to the finger ; contains greenish streaks and answers to the description of Lithomarge or rock-marrow, spec. grav. 2.457. With carbonate of soda, fuses before the blowpipe in the outer-flame into an opaque brown bead, becoming colourless on cooling. Does not fuse with borax. With biphosphate of soda, fuses in the outer flame into a transparent colourless bead. Its constituents by my analysis are

Silica, .	56.850	
Alumina, .	25.000	
Potash, .	6.178	
Lime, .	3.492	
Magnesia,	2.640	
Water, .	5.840	
	—	100.000

Its composition is therefore

Silica	19 Atoms.	Lime,	0.5 atoms.
Alumina,	7.5	Magnesia,	0.5
Potash,	1.0	Water,	4.0

The formula to represent its composition will be



Under this mineral we may, perhaps, include Berthier's Kaolins from St Tropez and Méné.

Summary of Observations of the Barometer, Thermometer, &c. Made at the Manse of the Parish of Abbey St Bathans, Berwickshire, Lat. 55° 52' N. Long. 2° 23' W., at the Height of about 450 feet above the Sea. By the Rev. JOHN WALLACE.

1836. MONTHS.	THERMOMETER.					HYGROMETER. (Leslie's.)					BAROMETER. (At 32° of Fahrenheit.)					Temperature of Spring Water.	Mean Point of Deposition.	Grains of Mois- ture in a Cubic Inch of Air.	Relative Hu- midity.	Rain in Inches.		
	At		At IX. III. A.M. P.M.	Means.		At		At IX. III. A.M. P.M.	Means.		At		At IX. III. A.M. P.M.	Means.								
	X. X. A.M. P.M.	Means.		X. X. A.M. P.M.	At IX. III. A.M. P.M.	X. X. A.M. P.M.	At IX. III. A.M. P.M.		X. X. A.M. P.M.	At IX. III. A.M. P.M.	X. X. A.M. P.M.	At IX. III. A.M. P.M.		X. X. A.M. P.M.	At IX. III. A.M. P.M.							
January,	36.7	35.9	36.3	36.0	37.0	7	7	7	6	8	7	29.218	29.196	29.207	29.219	29.173	29.196	45.5	31.5	0.0131	839	3.086
February,	36.4	34.5	35.4	36.2	33.5	37.3	10	6	8	9	11	29.221	29.243	29.232	29.214	29.221	29.217	45.5	29.7	0.0123	825	1.948
March,	40.4	36.3	38.3	38.9	41.9	40.4	13	4	8	11	16	29.814	28.807	28.810	28.810	28.796	28.803	46.0	33.2	0.0137	851	3.678
April,	42.9	38.3	40.6	42.8	46.0	44.4	18	7	13	14	22	29.268	29.282	29.275	29.270	29.246	29.258	46.5	40.2	0.0175	988	1.810
May,	52.1	44.0	48.0	50.6	54.8	52.7	25	10	17	23	33	29.783	29.776	29.779	29.767	29.748	29.757	46.5	40.7	0.0181	790	1.893
June,	57.1	49.8	53.4	56.0	59.2	57.6	21	5	13	18	25	29.258	29.254	29.256	29.258	29.245	29.251	46.2	48.4	0.0228	850	2.152
July,	56.5	51.4	53.9	55.5	58.7	57.1	17	5	11	16	21	29.294	29.307	29.300	29.286	29.286	29.286	46.5	49.9	0.0239	878	3.586
August,	56.7	49.8	53.3	55.5	58.5	57.0	18	4	11	15	21	29.442	29.452	29.447	29.443	29.423	29.433	46.5	48.8	0.0233	863	2.526
September,	50.9	46.1	48.5	49.7	51.4	50.3	10	2	6	8	13	29.298	29.302	29.297	29.290	29.291	29.285	46.5	46.3	0.0214	934	4.011
October,	46.0	43.1	44.6	45.0	47.6	46.3	7	3	5	9	7	28.169	29.192	29.180	29.162	29.170	29.166	46.5	41.7	0.0183	910	2.932
November,	38.3	36.9	37.6	37.3	39.3	38.3	3	2	3	2	4	29.897	28.919	28.908	28.900	28.867	28.883	46.5	35.8	0.0149	943	5.740
December,	37.2	36.8	37.0	36.6	37.6	37.1	5	3	3	4	5	29.156	29.171	29.163	29.150	29.137	29.143	46.5	34.4	0.0144	923	2.850
Means,	45.9	41.9	43.9	45.0	47.6	46.3	13	5	9	11	16	29.334	29.242	29.238	29.230	29.215	29.223	46.3	40.0	0.0178	883	
																			Amount for the year,		37.212	

Notice of Scolopax Major, Lin. &c. (Great or Solitary Snipe.) By P. J. SELBY, Esq.

ON the 8th of September, I killed a beautiful specimen of this rare British bird upon the moor within a mile's distance of Twizell House. It was first flushed by the setters when its peculiar flight attracted attention. Upon rising the second time when it was shot, the same difference of flight from that of the common snipe (*Scolopax Gallinago*) was observed. Upon dissection it proved a female. It was in high condition and very fat; its weight six ounces. It measured $11\frac{1}{2}$ inches in length; in extent of wing 18 inches; the bill short in comparison to that of the common snipe, $2\frac{3}{8}$ inches in length; tarsi $1\frac{1}{4}$ inch. When flushed it uttered no cry.

The following are some of the Rarer Nocturnal *Lepidoptera* taken this season at Twizell House :

Deilephila elpenor.	Apamea nictitans.
porcellus.	Miana literosa.
Macroglossa stellatarum.	strigilis.
Hepialus velleda.	minima.
Triphæna fimbria.	Scotophila porphyrea.
Mythimna grisea.	Xanthia Gilvago.
Caradrina alsines.	Miselia compta.
glareosa.	Polia herbida.
Hadena adusta.	serena.
genistæ.	chi.
Euplexia lucipara.	Acronycta menyanthidis.

Contributions to the Fauna of Twizell and new to the District.

ARVICOLA PRATENSIS	Mr Selby.
SOREX REMIGER,	—

Contribution to the Bivalve Shells of Berwickshire.

PHOLAS CRISPATA, Berwick Bay,	Mr Selby.
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Address to the Members of the Berwickshire Naturalists' Club, delivered at the Anniversary Meeting, held at Ford, 19th September, 1838. By Dr CLARKE, President.

GENTLEMEN,

IN the following summary of our transactions, I regret to say that our meetings have not been so fertile in new or interesting results as in former years, but they have continued to be, as heretofore, scenes of cheerful and rational enjoyment, animated by the same genial spirit—marked by the same friendly interchange of thought and opinion, and never, even for a moment, clouded by the shadow of angry or intemperate discussion. But though the Club, as an associated body, has fallen short of the reputation of other years, I rejoice to say, that her members individually have not slackened their efforts in the cause of Science. I mention, with especial pleasure, the description of the Berwick and North Durham Coalfield, given by Mr Milne at the meeting of the British Association, which Dr Buckland noticed in a strain of high panegyric;—an elaborate account of the Salmonidæ by Sir. W. Jardine, pervaded by a spirit of philosophic and dispassionate inquiry; and a systematic work on British Zoophytes by Dr Johnston, whose name is a sufficient warrant for fidelity of description and accuracy of induction, and which the scientific world will hail as filling up a blank in the Natural History of Britain.

The last Anniversary was held at Norham. The members, of whom there was a strong muster, after breakfasting with the Rev. Dr Gilly, proceeded to investigate the neighbourhood. One party examined the geological structure of the district, as disclosed by the banks of the Tweed, an account of which Mr Milne has forwarded to the Club. Drs Johnston and Douglas followed the windings of the river as far as Milne Graden, and obtained the following plants:—*Asplenium Ruta-Muraria*, an addition to the cryptogamic Flora of Berwickshire; *Asplenium marinum*, on rocks near Lady-kirk, three miles above tide-mark, and above ten from the sea; *Cistopteris fragilis*, from Lady's Bridge, Milne Graden; *Galium boreale*, from the Searth Crag; *Thalictrum majus*; *Euonymus europæus*; *Lysimachia nummularia*; *Lactuca virosa*; *Viola hirta*, &c., on the rocky and woody banks of the Tweed.

The Christmas Meeting took place as usual at Berwick, and was well attended. Mr Henderson of Chirnside sent specimens of *Melalontha vulgaris*, and *Rhagium bifasciatum*, taken in his neighbourhood. Mr Selby mentioned that the dipterous fly, taken at Houndwood last May, was *Tachina ursina*. Dr Douglas exhibited specimens of *Trochilium crabroniforme*, in its different stages of caterpillar, chrysalis, and moth, together with a specimen of *Salix capræa*, perforated by the caterpillar, from the Hirsell.

After dinner a long and interesting communication from Mr David Milne was read concerning some lenticular shaped stones, which were found imbedded in soft and slaty shale on the high and precipitous banks of the Tweed, near Norham, on the north side of the river. These stones on being fractured presented also a lenticular arrangement, and were found to consist partly of arenaceous, partly of argillaceous, matter. Mr Milne likewise mentioned the occurrence of similarly shaped stones in a red sandstone quarry in the grounds of Ladykirk House, about three-quarters of a mile above the spot where the stones were situated in the shale. Mr Milne added some observations on the frequent occurrence and probable formation of these stones; the latter he attributed to a peculiar process of crystallization excited among the particles of the stratum where they were imbedded; the predisposing cause he attributes to the presence of a quantity of iron (which they all contain) impregnating the particles, and giving them the tendency to arrange themselves in this particular form. This process, he observes, must have taken place previous to the consolidation of the strata in which they were imbedded. Mr Milne further observed, that he had proceeded to the bank below Norham Castle, where an old quarry was situated, in search of certain pyriform stones. Owing, however, to the quarry being filled up with rubbish, he was unable to procure any, but he shewed several which had been obtained several years ago by Sir David Milne when the quarry was worked. They vary in size from two inches to two feet in diameter. Mr Milne concluded his paper by proving from the different strata of sand and gravel at and near the village of Norham, that the River Tweed had at some former period flowed in a channel about twenty-five feet higher than that which it now occupies.

The Club met for the first time this year at Eyemouth. "After breakfasting with the Rev. Mr Turnbull, the members took their walk, which lay along the sinuous rocky coast between Eyemouth and Coltingham. The day was favourable, and as the locality is a fine one, the Club had often occasion to halt that they might leisurely examine and admire many little creeks, basins, and promontories, rendered interesting by their geological structure, or their rugged picturesqueness. One place exhibited a very plain overlying of the sandstone above the trap, and gave rise to much speculative conversation, which was interrupted and deleted by the unexpected appearance of a fine Grampus, sporting in the sea below. He moved, at measured pace, along the coast northwards, and was so near as to afford a full view of him, that no doubt was left of his character and designation. The zoologists saw little else worthy of notice. A Wheat-ear, which Mr Selby remarked was the second only he had seen this season,—a Solan Goose,—a green Cormorant in his spring plumage,—and an Eider Duck, were, amongst others, of common occurrence. Mr Selby captured a few insects, whose names he will communicate at another meeting. On

the shore nothing novel occurred, excepting a *Planaria*, picked up by Mr Riddell, allied to the *Pl. Arethusa* of Dalyell, but differing in being a denizen of salt-water.

“In Botany nothing new was seen. The banks, in many places, were covered with the *Cochlearia officinalis*, now in full flower; and about mid-way between Eyemouth and Coldingham, the Primrose, Cowslip, and Oxlip, were observed; the Primrose and Oxlip growing intermixed, and shewing too many features of a common resemblance, to be considered descendants of distinct and separate stocks. Wherever the Primroses grew, the bank was, as usual, enamelled with its never-failing consorts—the Pile-wort (the lesser *Celandine* of Wordsworth)—the Dog-violet—the barren Strawberry—and the Field-Rush, now all in flower and beauty.

“After dinner the minutes of last meeting were read and approved of. The Rev. Thomas Riddell, Fellow of Trin. Coll. Cambridge, on the nomination of Dr Johnston, seconded by Dr Clarke, was admitted a member.

“Mr Milne exhibited part of the stock of an anchor, which, after having been sunk in the entrance of Eyemouth Harbour for about eight years, had been taken up and removed, in consequence of being rendered useless by the decay of the stock. It was very satisfactorily proved that this decay was the effect of the *Limnoria terebrans*—the first instance of the occurrence of this noxious insect on the Berwickshire coast.

“The Rev. Andrew Baird was instructed to draw up a Report for next meeting, on the effects of the past winter, as shewn in plants and shrubs, &c., as well as on animals; and members were invited to communicate any facts that might assist him in this work.

“It will be observed, then, that at this meeting of the Club there was no paper read—no discovery made—no business prepared—and none to leave behind it a permanent trace—and yet your Secretaries would instance it as a proof of the utility and rationality of your Society. It led, let it be remarked, to the detection of an insect in Eyemouth harbour, which may be of advantage; for knowing, as they now do, its existence and nature, the managers of that port will need to keep a careful eye on its wood-works; and it will prevent disappointment and useless expenditure of money, if, in future, they adopt means to protect whatever wood is used from its ravages. Kyanized wood may probably be unsuitable to its taste; and, we believe, that to cover the wood with broad-headed nails, has been found a good remedy or preventive.

“But, independent of this, the meeting was not the less valuable to the members individually. A day was spent by them agreeably, if not in high, at least in conversation relating to interesting topics, which, though not necessary to a man, are ornamental and improving. Relaxation, too, at stated intervals, is to the mind what some periodical

discharges are to the body, giving it fresh elasticity and health ; and a relaxation of a better character than what our meeting afforded, it will not be easy to procure. The mind was set at ease, and the imagination was left to roam, but not unchecked ; for, by the society of congenial minds, and by the influence of the outward scenes, its wanderings was limited to objects all of a pleasing character, and that had a direct tendency to lead it to the contemplation of the omniscience and providence of our Maker, as made visible in these his lower creations. That these are the results of our association is not imaginary ;—they were shewn to be real not merely in the pleased contentment which every member's countenance and conduct evidenced, but in the whole tenor of the conversation that passed,—a conversation that knew no pause—that went from theme to theme with every possible variety—and yet, which never needed an apology to propriety, nor left a wish that a word might be recalled.”

In these remarks I hope the Club recognise “the sweet Roman hand”—the genial spirit of our worthy Secretary Dr Johnston, delighted to refer everything to the Deity, and looking abroad in Nature, only to find evidences of his goodness.

The next meeting took place at Lauder, June 13, when the only members present were the office-holders of the Club. Few objects of interest presented themselves. The season had been ungenial, and flowers and insects, those children of the Sun, appeared in slender numbers. Dr Douglas explored a marshy hill about 2 miles to the north-west, covered with natural wood, willows, oaks, and elms. Towards the summit, the juniper and great bill-berry were observed sparingly. The banks of the Leader, above Lauder, seemed remarkably barren ; but in the gravelly channel of the stream, *Lepidium Smithii*, a phenogamous plant, new to Berwickshire, was gathered abundantly by Drs Johnston and Douglas. *Salix Forbiana* was the only other rare plant gathered. The remoteness of Lauder, lying at the western extremity of Berwickshire, sufficiently accounted for the scanty attendance of members ; and it was resolved that, in future, without especial reason to the contrary, the stations should be fixed at more accessible distances.

In July, the Club assembled at Greenlaw. After breakfast, the members proceeded to Greenlaw Moor, which, together with the adjoining boggy ground, occupied their attention during the day. The following plants were gathered ; *Lycopodium clavatum* ; *Genista anglica*, which had stood the winter's extreme cold unscathed, while the apparently more robust whin had died under its severity ; *Helioscadium inundatum* ; *Habenaria viridis* ; *Hippuris vulgaris* ; *Hydrocotyle vulgaris* ; *Polypodium dryopteris*, fringing an old earth wall ; *Listera ovata* ; *Sphagnum acutifolium* and *obtusifolium*, the latter only in fruit ; *Veronica scutellata* ; *Uredo Lini* ; and several species of *Carex*.

Gentlemen,—Whilst the rapid progress of the sciences of late years—the light which they mutually shed upon each other, and the nearer relationship which they manifest as we trace them to their source—must have been contemplated with pleasure by the members of this Association, they must also have observed, with pain and regret, a spirit of misguided zeal arraying itself against the results of Physical inquiry, as if the discovery of facts and laws in the material world could weaken the authority or invalidate the truths of Scripture. It may not be irrelevant or unimportant to advert to this subject for a moment, to shew that, however well-intentioned the parties may be who maintain this controversy, they have entirely misconceived the spirit and mistaken the objects of Revelation; and rather than be drawn out of their accustomed circle of thought, are willing to close their eyes to the clearest demonstrations of natural truth.

The dread of finding the Book of Nature at variance with the Book of Revelation is vain and groundless. They both alike proceed from the Author of all truth, and, when rightly interpreted, cannot contradict each other. But there is this grand difference between them: the one contains the moral history of our species—our relation to the Deity—the conditions of salvation, and the great mystery of the Atonement; the pages of the other lie patent to our view, and require only the use of our reason and senses to decipher them. The truths and mysteries of the one are disclosed to us, because they are, from their nature, beyond the reach of our faculties. We make ourselves masters of the knowledge revealed in the other, by the powers of our understanding, and the evidence of our senses. The one was freely given to us, as it embodied information necessary to our happiness, yet unattainable by our reason. The other was unrolled as an ample volume to be studied and decyphered by successive generations of mankind with increasing wonder and delight, as every page continued to disclose fresh evidences of the wise and beneficent purposes of the Almighty Author. The one is a storehouse of moral and religious, the other of physical truths. They both concur in affirming the unity of the Godhead. They both declare that this glorious world is His work, and that it is neither the result of chance, nor has existed for ever. They are both embodied expressions of his Will, and manifestations of his Power. Further than this, they have nothing in common. The attempt to strengthen and confirm the authority of revelation by the aid of science, and, in turn, to frame theories in accordance with pre-conceived notions of the intent and purport of Scripture, has operated to the serious injury both of natural and revealed truth. For some have been deterred altogether from scientific investigation, lest they should discover anything to shake their reliance on Scripture; others, having seen one mode of interpretation confirmed by the conclusions of science in a certain state of knowledge, have had their faith shaken, and their religious feelings jarred, by the disclosure of new

facts which stood in opposition to the former theory. The Mosaic account of the creation was simply intended to lift the grovelling imaginations of the early inhabitants of the earth, from the vain objects of their idolatry, to one God—the great First Cause and author of all things. It was necessary, in this representation, not to contradict the prevailing notions of the time, else the revelations would have been rejected as monstrous and incredible. The Deity is described throughout as man, though with infinitely superior powers, as being occupied in the work of creation for a certain definite period of time—6 days, as if the thought and act of an omnipotent Deity were not simultaneous and coincident; and as if the term of a day, by which we measure a revolution of our planet, could have any relation to Him, of whose will the law which governs the motions of our system is but a single expression. He is represented as accessible to human feelings, and swayed by human passions. We know that, in reference to Him, time can have no meaning—that a thousand years are but as one day, and one day but as a thousand years—that He is incapable of change, the same to-day, yesterday, and for ever, and without any variableness or shadow of turning. But so thought not the simple Fathers of our race; and all these particulars which imply a limited, and, therefore, incorrect idea of the Godhead, are evident accommodation to the state of knowledge at the time, and, accordingly, as we proceed, we find juster and more exalted notions of the nature and perfections of the Deity begin to open upon the sacred writers.

Again: if the revelation of Moses had included all the physical truths which now obtain universal credence, from the infallible evidence on which they rest, one of two results must have taken place—either, that Man must have been endued with an intuitive power of apprehending these truths, and have been a passive recipient of the knowledge communicated, the use of his reason precluded, and every discovery in science forestalled—or, belief in such sublime disclosures must have been impossible; and so must it have been at any period of the world's history, for science changes its character as it advances, and, even now, the extent of our survey only discloses to us a horizon of proportionate magnitude beyond, over which hang clouds and darkness. If, for example, the quiescence of the Sun in the centre of system, and the mobility of the Earth, had then been enunciated, the dogma would at once have been rejected as a manifest falsehood. But this grand truth, resting on infallible demonstration, is now recognised throughout the civilized world, and the authority and integrity of Scripture, as to its essential truths, remains intact and unassailable. Yet the same spirit which would have kept back the truth in the case of Galileo, and deterred him from announcing or following up his discoveries, is now arrayed to decry and impugn the truths revealed by geology—a science which has opened up a new field for the display of the beneficent providence of the Deity. It is

lamentable to think that the same delusion, how often soever refuted and exposed, shows itself ever and anon in undiminished vigour, as if the lessons of experience, and the monitions of history, included within them no voice of warning.

We can only hope that this unhappy spirit of dogmatism which would lay prostrate our reason, and reject the evidence of sense—which would erect a spiritual despotism within the realm of thought, will gradually fade and disappear before the increasing light of truth and knowledge. The sum of our argument, then, is, that revelation and science are totally different in their nature—essentially distinct and dissimilar in the subjects of which they treat—and must each be studied without reference to, and independently of, the other. Indeed, after the ordinance of Virtue, there is nothing so repeatedly and urgently enjoined in the Divine writings as a spirit of inquiry and the acquisition of knowledge; and it hath pleased Him who adapted our mental constitution to the visible world around, to annex pleasure both to its pursuit and acquisition, and, it is certain, that, next to purity of life, knowledge is its own great and self-sufficing reward.

It would be superfluous to show how much our enjoyment of the external world is enhanced by the study of Natural Science. A thousand avenues of enjoyment lie patent to the cultivated man, from which the ignorant is shut out. He comes in contact, as it were, with Nature, at a thousand points. He sees her under an infinitude of aspects, and, instead of stupid wonder or superstitious dread, the magnificent phenomena of the material world offer to him only a theme of enlightened admiration and love. "Nature," to adopt the language of the great Poet of our age.

"Nature never did betray
The heart that loved her; for she can so inform
The mind that is within us, so impress
With quietness and beauty, and so feed
With lofty thoughts, that neither evil tongues,
Rash judgments, nor the sneers of selfish men,
Shall e'er prevail against us, or disturb
The cheerful faith, that all which we behold
Is full of blessings."*

Let me, in conclusion, be permitted to observe, that to collect facts and observe phenomena, though the first step and only sure basis of science, yet does not constitute Science itself. The genuine votary of Nature will not rest satisfied with her outward and visible revelations, but will seek to penetrate the mysteries of the sanctuary. He will endeavour, by observation and experiment, by the classification of phenomena, and the tracing of analogies and relations, to rise from effects to causes, and to discover those principles and laws which constitute the highest aim, as well as the chief privilege of Philosophy. It is by this process of induction that the System of the World, instead of presenting a confused assemblage of unconnected facts and unexplained pheno-

* Wordsworth.

mena, is converted into a beautiful and consistent scheme, of which symmetry, harmony, and order, are the unvarying and essential attributes. It is this principle which distinguishes modern science from the labours of the ancients—which deposes from their usurped authority the powers which Ignorance raised up to direct, control and preside over the phenomena of the world. It is this principle which, as Science advances, gathers fresh proofs of the profound mechanism of the universe, and which, amid all the seeming discrepancy and real dissimilarity—the vast complexity and inexhaustible variety—the infinitely minute and inconceivably great—shows all nature to be interpenetrated and pervaded by Laws whose operation is constant, unvarying, and universal; and as the discovery of truth almost necessarily implies the exposure of error, it is by this principle that the human mind is disenthralled from the baneful influence of superstition, and the road to truth disencumbered of the impediments which retard our progress.

Lastly, and certainly not the least important consequence of the inductive philosophy it is, that as the bounds of our knowledge are extended, the single Personality of the Deity becomes a more convincing and unimpeachable truth, and our views of the Divine perfections grow more exalted and sublime as they become more just and rational.

And when we contemplate the magnificent array of science—the accumulated wisdom of the world—the reflection which is forced on our minds is—not any shallow boast of knowledge—not any overweening pride of reason—but a humble yet confident hope, a deep and influential conviction, that the being who has thus lifted up the veil from the seeming mysteries of Nature—who has penetrated, as it were, the counsels of the Deity, and brought to light countless proofs of his wisdom, goodness, and power, must be with Him an object of care and favour; and that we are not only thereby raised in the scale of moral intellectual existences, but permitted, in some degree, a foretaste and anticipation of that state of being when we shall no longer behold His image darkly shadowed forth in His works, but shall see him “face to face” in the fulness of knowledge.

A List of the Fishes of Berwickshire, exclusive of the Salmones.

By GEORGE JOHNSTON, M.D.

1. *PERCA FLUVIATILIS*, *Linn.* The Perch. Coldingham Lough ; Hirsell Lough ; in still parts of the Tweed, descending to within two miles of its mouth.
2. *PERCA LABRAX*, *Linn.* The Basse, *Yarr.* Occasionally taken in the salmon nets at the mouth of the Tweed.
3. *TRACHINUS DRACO*, *Linn.* The Great Weaver, *Penn.* Rare, but a few specimens are annually taken in our bay during the summer.
4. *TRACHINUS VIPERA*, *Cuv.* Lesser Weaver, *Yarr.* Stang-fish, *Prov.* Not uncommon in our bay, and believed to inflict a venomous wound by its strong fin rays.
5. *MULLUS BARBATUS*, *Linn.* Plain Red Mullet, *Yarr.* A specimen taken on our coast in the autumn of 1836, and presented to me by the Rev. A. Baird.
6. *TRIGLA GURNARDUS*, *Linn.* The Grey Gurnard, *Yarr.* The Gurnett or Crooner, *Prov.* Common on our coast, and a good fish for the table, though rarely brought to market. Subject to great variety in colour ; and I have seen a specimen which was coloured and marked on the dorsal fin like the *Red Gurnard*. The provincial name may have reference either to the hard and somewhat peculiarly shaped head of this fish, from *croon*—the top of the head ; or it may be derived from the verb *croon*, viz. to hum an air in an unmusical tone, because of the peculiar noise which the fish sometimes utters on being taken from the water. It sometimes reaches the length of 15 inches, but it rarely exceeds 9 or 10. Spawns in spring ; and is fittest for the table in winter.
7. *TRIGLA PINI*, *Bloch.* Red Gurnard, *Yarr.* A rare species on the coast of Berwickshire.
8. *COTTUS SCORPIUS*, *Bloch.* Sea Scorpion, *Yarr.* Frequent in pools of water between tide marks, and under stones at low water-mark.
9. *COTTUS BUBALIS*, *Cuv.* Father-Lasher, *Yarr.* Tuck, *Prov.* With the preceding, with which it is confounded by our fishermen.
10. *ASPIDOPHORUS CATAPHRACTUS*, *Jenyns.* The Armed Bullhead, *Yarr.* Miller's Thumb, *Prov.* Frequent at the mouth of the Tweed.
11. *SCORPENA NORVEGICA*, *Cuv.* Sea Perch, *Penn.* The Bergylt, *Yarr.* In 1832, I procured a specimen in our bay, which was sent to Mr J. E. Gray of the British Museum.
12. *GASTEROSTEUS ACULEATUS*, *Linn.* The Three-spined Stickleback, *Penn.* Bainstickles, *Prov.* Of this common fish we have the following varieties :

(a.) Rough-tailed Stickleback, *Yarr.*

- (b.) Half-armed Stickleback, *Yarr.*
- (c.) Smooth-tailed Stickleback, *Yarr.*
- (d.) Four-spined Stickleback, *Yarr.*

Dr Parnell, in May 1836, took two specimens of the last in the pools left by the tide on Yarrow-haugh, Berwick; and he is of opinion that it is different from the four-spined Stickleback of Yarrell, but the only difference I can perceive is, that the 2d ray of the dorsal fin is shorter than the 1st or 3d, while in Yarrell's they appear to be nearly all of the same size. Dr P. agrees with those authors who consider all the varieties as properly constituting distinct species; but because they are to be always met with in the same pools, living and mixing freely together, and because it is not seldom difficult to refer a specimen to its supposed species, from an obscurity or commixture of characters, I have preferred following the example of Mr Jenyns, in his Manual of our Native Vertebrate Animals.

13. *GASTEROSTEUS SPINACHIA*, *Linn.* Fifteen-spined Stickleback, *Penn.* Of not uncommon occurrence in the Tweed, at its mouth, and occasionally taken in the bay. I have had this fish brought me as the young of the Sturgeon!
14. *SPARUS AURATA*, *Linn.* Gilt-head, *Yarr.* Rare. A specimen occasionally taken, during the summer, at the mouth of the Tweed.
15. *SPARUS CENTRODONTUS*, *Jenyns.* The Sea-Bream, *Yarr.* Not uncommon.
16. *BRAMA RAI*, *Cuv.* Toothed Gilt-head, *Fenn.* Ray's Bream, *Yarr.* Rare. I have seen two specimens only cast on shore after a storm; and the Rev. Mr Baird has seen another, which had suffered a similar wreck, on the shore below Cockburnspath.
17. *SCOMBER SCOMBER*, *Linn.* The Mackerel, *Yarr.* Common.
18. *CARANX TRACHURUS*, *Cuv.* The Scad, or Horse-Mackerel, *Yarr.* Of occasional occurrence during the herring season.
19. *ZEUS FABER*, *Linn.* The Dory, *Yarr.* Rare.
20. *MUGIL CHELO*, *Cuv.* The Thick-lipped Grey Mullet, *Yarr.* The Mullet, *Prov.* Of frequent occurrence in the bay in autumn,
21. *BLENNIUS PHOLIS*, *Linn.* The Shanny, *Yarr.* Common, lurking under stones between tide marks.
22. *BLENNIUS YARRELLII*, *Valenc.* B. Palmicornis, *Jenyns.* The Crested Blenny, *Yarr.* Very rare. In pools between tide marks. My specimen was taken on January 27. 1833.
23. *BLENNIUS GUNNELLUS*, *Linn.* Spotted Blenny, *Penn.* The Spotted Gunnel or Butterfish, *Yarr.* Common under stones between tide marks.
24. *ZOARCES VIVIPARUS*, *Cuv.* The Viviparous Blenny, *Yarr.* Barber Eel, *Prov.* Frequent, especially in the river near its mouth.

25. *ANARRHICHAS LUPUS*, *Linn.* Wolf Fish, *Yarr.* Sea-Cat, *Prov.* Not uncommon. "An uglie fish to sight, and yet verie delicat in eating, if it be kindlie dressed." It is seldom or never brought to market, but the few who know its good quality, buy the fish when offered to them. A fisherman having cut off the head of an individual, attempted to remove the hook from the mouth upwards of an hour afterwards, when the jaws closed so forcibly, that the teeth were thrust through his thumb, and he was incapacitated for work for a week after. The head of a skate will snap, and give evidence of life the day after it has been removed from the body.
26. *GOBIOUS BIFUNCTATUS*, *Yarr.* The Doubly-spotted Goby, *Yarr.* In pools left by the recess of the tide.
27. *CALLIONYMUS LYRA*, *Linn.* Gemmeous Dragonet, *Penn.* The Goldie, *Prov.* This remarkable and beautiful fish is not uncommon on our coast.
28. *CALLIONYMUS DRACUNCULUS*, *Linn.* Sordid Dragonet, *Penn.* Less common than the preceding. It appears to be now nearly established that this is distinct from the preceding.
29. *LOPHIUS PISCATORIUS*, *Linn.* Common Angler, *Penn.* The Fishing Frog, *Yarr.* The Sea Devil, *Prov.* Not uncommon.
30. *LABRUS MACULATUS*, *Bloch.* Ballan Wrasse, *Yarr.* Sea Sow, *Prov.* Frequent, living near low-water mark in rocky places.
31. *LABRUS RUPESTRIS*, *Selby.* Jago's Goldsinny, *Selby.* After a very severe storm in February 1836, numerous specimens of this pretty fish were thrown ashore, of which five came into my possession. Our fishermen considered it the young of the Sea Sow.
32. *CYPRINUS TINCA*, *Linn.* Tench, *Penn.* Hirsell Lough,—an artificial piece of water, first filled in the month of December, 1716.—*Lord Home*.*
33. *LEUCISCUS PHOXINUS*, *Cuv.* The Minnow. Common.
34. *COBITIS BARBATULA*, *Linn.* The Loach, *Yarr.* Beardie Loch, *Prov.* In the Tweed, and in several of our burns.
35. *ESOX LUCIUS*, *Linn.* Pike. Hirsell and Litthilm Lochs, Tweed and Whiteadder, though rare in the latter, the Leet, Eden Water, &c. In the Hirsell Loch, "the Pike run to a great size—one of them weighed 35 pounds, but from 10 to 20 pounds is the average weight of those caught in the nets."—*Earl of Home*.
36. *BELONE VULGARIS*, *Flem.* The Garfish, *Yarr.* Greenbone, *Prov.* A few specimens are annually taken during the herring season. When a paragraph in a provincial newspaper announces the capture of a *Sword Fish* on our coast, the naturalist may register the

* I am not aware that the Carp (*Cyprinus Carpio*) is met with in any part of Berwickshire. Gold and Silver Fish (*C. auratus*) are favourite ornaments in a room, but seldom live long with us.

latter among the synonyms of the Garfish. The bones are grass-green naturally, and the colour is not the effect of boiling, as is usually stated.

37. *BELONE SAURUS*, *Jenyns*. The Saury Pike, *Yarr*. Rare.
38. *OSMERUS EPERLANUS*, *Fleming*. The Smelt, *Penn*. Very rare in the Tweed, where, indeed, I have heard of only one specimen being taken, and which was readily recognised by a fisherman to whom the fish was familiar, as he had often taken them in the Tay.
39. *CLUPEA PILCHARDUS*, *Bloch*. Pilchard. Rare, but a few specimens are generally taken during the herring season.
40. *CLUPEA HARENGUS*, *Linn*. The Herring. Visits our bay during the harvest months in great numbers. In Wallis' time (1769), "enough for export" were not taken.
41. *CLUPEA SPRATTUS*, *Bloch*. The Sprat. Common. A favourite food of the salmon tribe.
42. *CLUPEA ALOSA*, *Cuv*. The Shad or Rock Herring, *Prov*. The Allice Shad, *Yarr*. Frequently taken at the mouth of the Tweed in autumn, and sold in the market, but held in no estimation. The true Shad I have not found on this coast.
43. *GADUS MORRHUA*, *Linn*. *Morrhua vulgaris*, *Cuv*. The Cod. Common. The young are called *Codlings*; and when the fish is of a red colour, which it assumes after lying some time among weedy rocks, it is then called *Rock Cod* or *Codling*. A fisherman, on whose word I can rely, told me that he once caught a cod with a hare in its stomach; and in the stomach of another he found a white turnip.
44. *GADUS ÆGLEFINUS*, *Linn*. *Morrhua æglefinus*, *Cuv*. The Haddock. "Taken in such abundance as to furnish all tables, and to reward the toil of the hardy fishermen." *Wallis*.
45. *GADUS LUSCUS*, *Linn*. *Morrhua lusca*, *Flem*. The Bib, Pout, and Whiting-pout, *Yarr*. The Malled, *Prov*. Not uncommon.
46. *MERLANGUS VULGARIS*, *Flem*. Whiting. Common.
47. *MERLANGUS CARBONARIUS*, *Flem*. Coal-fish, *Penn*. When young it is called with us the *Podlie*; when somewhat larger the *Podler*; and when full grown the *Coal-sey*, or *Black Coal-sey*.
48. *MERLANGUS POLLACHIUS*, *Cuv*. Pollack, *Penn*. Lythe, *Prov*. Common.
49. *MERLUCCIUS VULGARIS*, *Cuv*. The Hake, *Penn*. Rare.
50. *LOTA MOLVA*, *Jenyns*. The Ling. Common, though much less so than the Cod.
51. *MOTELLA MUSTELA*, *Nilss*. *Gadus mustela*, *Linn*. Five-bearded Cod, *Penn*. The five-bearded Rockling, *Yarr*. Not uncommon in rocky pools, near low water-mark.

52. *RANICEPS TRIFURCATUS*, *Flem.* Trifurcated Hake, *Penn.* Tadpole fish, *H. Davies.* Rare. I have already stated my reasons for believing that the *Raniceps* Jago of Fleming is not distinct from this, and the opinion has been generally adopted.
53. *PLATESSA VULGARIS*, *Flem.* Plaice, *Penn.* Common.
54. *PLATESSA FLESUS*, *Flem.* Flounder, *Penn.* The Fluke, *Prov.* Common. Ascends the Tweed as far as the Till, which river it also enters. Found in the Whiteadder, and in our other burns which have a communication with the sea.
55. *PLATESSA LIMANDA*, *Flem.* The Dab. Common. Its favourite food appears to be the pretty *Pecten obsoletus*.
56. *PLATESSA MICROCEPHALA*, *Flem.* Smear-Dab, *Penn.* Lemon Dab, *Jenyns.* Bastard Sole, *Prov.* Not common.
57. *PLATESSA LIMANDOIDES*, *Jenyns.* Long rough Dab. *Yarr.* Not rare.
58. *HIPPOGLOSSUS VULGARIS*, *Flem.* Halibut, *Penn.* The Turbot of our market. Common.
59. *PLEURONECTES MAXIMUS*, *Linn.* Turbot, *Penn.* By our fishermen called the Turbrat or Roddams. There is a fishery for this prized fish at Burnmouth; and it is occasionally taken on all parts of our coast.
60. *PLEURONECTES MEGASTOMA*, *Don.* The Whiff, *Yarr.* I believe this is very rare. My specimen was named by Mr Yarrell.
61. *PLEURONECTES RHOMBUS*, *Penn.* Pearl, *Penn.* The Brill, *Yarr.* Rare.
62. *PLEURONECTES HIRTUS*, *Mull.* Muller's Topknot, *Yarr.* Rare.
63. *SOLEA VULGARIS*, *Flem.* The Sole. Not uncommon.
64. *CYCLOPTERUS LUMPUS*, *Linn.* Lump-Sucker, *Penn.* Cock and Hen Paidle, *Prov.* Not uncommon. The Paidle spawns towards the end of March, and in April. At that season the *Hen* approaches the shore and deposits her spawn among the rocks and sea-weed within low water-mark, and immediately afterwards returns to deeper water. The male then covers the spawn with his sperm, and according to the testimony of our fishermen, remains covering it, or near it, until the ova are hatched. The young soon after birth fix themselves to the sides and on the back of their male parent, who sails, thus loaded, to deeper and more safe retreats. He is only one-half the size of the Hen, and at the breeding season his belly becomes of a reddish colour. The spawn of a single female will fill a large basin, and is of a beautiful pink colour: the eggs globular, and about the size of swan-shot. Not in use as food, but the Cock especially is reported to be excellent when fried or baked.
65. *CYCLOPTERUS LIPARIS*, *Linn.* *Liparis vulgaris*, *Flem.* Unctuous Sucker, *Penn.* Not common.

66. CYCLOPTERUS MONTAGUI, *Don*. Liparis Montagui, *Flem*. Montagu's Sucking-fish, *Parr*. Rare.
67. ANGUILLA ACUTIROSTRIS, *Yarr*. Common Eel, *Penn*. Sharp-nosed Eel, *Yarr*. Common.
68. ANGUILLA LATIROSTRIS, *Yarr*. The Broad-nosed Eel, *Yarr*. Dr Parnell gave me a small specimen taken in the Tweed, where I believe it is not uncommon, and is distinguished from the others by the name of Silver-Eel.
69. CONGER VULGARIS, *Cuv*. Anguilla Conger, *Jenyns*. Conger, *Penn*. The Conger-Eel. Not common. Attains a large size.
70. AMMODYTES TOBIANUS, *Bloch*. Sand-Launce, *Penn*. The Sand-Eel. On sandy parts of the coast, whence it is dug with an old hook at low tide.
71. AMMODYTES LANCEA, *Cuv*. The Sand-Launce, *Yarr*. More common than the preceding, from which it is not distinguished by our fishermen.
72. SYNGNATHUS ACUS, *Linn*. Pipe-fish, *Penn*. The Great Pipe-fish, *Yarr*. Not common.
73. SYNGNATHUS ÆQUOREUS, *Linn*. The Æquoreal Pipe-fish. *Yarr*. Rare. A fine specimen, taken in our Bay, was brought to me alive; and Mr Embleton has also had it from near Dunstanborough Castle. According to M. Fries the Syng. ophidion of *Jenyns* and *Yarrell*, (not of *Linn*.), is the male of this species. See Annals of Nat. Hist. ii. p. 103.
74. SYNGNATHUS LUMBRICIFORMIS, *Yarr*. (not of *Jenyns* according to M. Fries). Little Pipe-fish, *Penn*. The Worm Pipe-fish, *Yarr*. Apparently not rare, lurking among the coarser wracks (Fuci) between tide marks.
75. ACIPENSER STURIO, *Linn*. The Sturgeon. One or more specimens are almost annually taken in our bay or river.
76. SQUALUS CANICULA, *Linn*. Scyllium Catulus, *Flem*. The Small-spotted Dog-fish, *Yarr*. Rare.
77. SQUALUS CORNUBICUS, *Gmel*. Lamna cornubica, *Flem*. Porbeagle Shark, *Yarr*. I have seen several specimens of this Shark taken in our bay from five to eight feet in length. It is undoubtedly of this species that Wallis gives the following account:—"An exotic and singular-coloured Shark was taken in a salmon-net at the ostium of the Tweed, a little above the bridge, in September 1757. It was six feet long, and of a greenish colour; the mouth armed with teeth large and formidable. The fishermen, on first hauling the net, were in rapturous expectation of an extraordinary and unusual draught of salmon, but on drawing it near to the shore, great was their consternation and surprise on the sight of this dangerous creature, which made the water fly about their ears to a prodigious height. It is supposed to have followed the East

- India fleet to Edinburgh Firth, and to have directed its course southwards, in forward and eager pursuit, after the salmon." Nat. Hist. of North. i. p. 378.
78. *SQUALUS GALEUS*, *Linn.* *Galeus vulgaris*, *Flem.* Tope, *Penn.* The Common Tope, *Yarr.* Occasionally taken in the bay from five to six feet in length.
79. *SQUALUS MUSTELUS*, *Linn.* *Mustelus lævis*, *Flem.* Smooth Hound, *Penn.* Not uncommon.
80. *SQUALUS ACANTHIAS*, *Linn.* *Spinax acanthias*, *Flem.* The Picked Dog-fish, *Yarr.* Dog-fish, *Prov.* Very common. The young are spotted with white along the back.*
81. *RAIA BATIS*, *Linn.* The Skate. Common.
82. *RAIA OXYRHYNCHUS*, *Mont.* The Sharp-nosed Ray, *Yarr.* Not uncommon, and attains a very large size. I have measured one which was seven feet nine inches in length, and eight feet three inches in breadth.
83. *RAIA CLAVATA*, *Linn.* Thorn-Back. Common.
84. *RAIA RADIATA*, *Don.* The Starry Ray, *Yarr.* Not rare.
85. *PETROMYZON MARINUS*, *Linn.* Sea-Lamprey, *Penn.* The Nine-eyed Eel, *Prov.* Not uncommon.
86. *PETROMYZON FLUVIATILIS*, *Linn.* Lesser Lamprey, *Penn.* The Lampern or River Lamprey, *Yarr.* I have seen two or three specimens which were taken in the Tweed.
87. *PETROMYZON PLANERI*, *Cuv.* The Fringed-lipped Lampern, *Yarr.* "I am indebted to the kindness of Sir William Jardine for two specimens of the young of this species, which were sent from the Tweed." *Yarrell.* I have been told that it is not uncommon in the Tweed at Melrose.
88. *MYXINE GLUTINOSA*, *Linn.* Glutinous Hag, *Penn.* Not uncommon.

An Account of some Additions to the Flora of Berwickshire, by
C. C. BABINGTON, Esq.

(In a letter addressed to Dr Johnston.)

ST JOHN'S COLL. CAMBRIDGE,
Nov. 21. 1838.

DEAR SIR—According to your request, I now propose giving a short notice, for the Berwickshire Club, of the more interesting plants

* I have been told by a fisherman, that he has seen an *Angel-fish* (*Squatina angelus*, *Cuv.*) which was taken in our bay many years ago.

which I gathered during my visit to you at Berwick-upon-Tweed in September last. The district included in your Flora has been so carefully examined, by yourself and other excellent botanists, that it was not to be expected that any new plants would be found within it, except such as are included in genera which have been almost totally neglected in Britain. I refer to *Atriplex*, *Chenopodium*, and, perhaps, I may be allowed to add, *Potamogeton*; for, although more attention has been paid to this latter genus than to the two others, yet it has never been studied with sufficient minuteness until very recently.

1. *ATRIPLEX ROSEA*, *Linn.* (Sp. pl. 1493). Stem herbaceous spreading, the branches patent, leaves ovato-triangular, unequally sinuato-dentate; calyx of the fruit rhomboid, acute, dentated, the back with a double series of tubercles; clusters of flowers axillary and terminal. *Mert. and Koch.*, ii. 307; *Host. Fl. Aust.*, i. 320; *Fries Nov.*, 286; *Ledebour Fl. Alt.*, iv. 314; *Koch. Syn.*, 611. *A. alba Reich. Fl. Excurs.*, n. 3735. *A. patula* β . *Sm. Fl. Brit.*, iii. 1092.

This plant is most nearly allied to *A. laciniata*, from which it is distinguished by the shape of its enlarged fruit-bearing calyx, which in that plant is irregularly rhomboid, or rather three-lobed, the two lateral lobes being truncate, the intermediate acute.

This plant is in profusion on the SW. side of Holy Island, a little above high water-mark, and it also occurs in several spots on the coast and river banks near Berwick. When it grows within reach of the water, and in muddy ground, it becomes much larger and more fleshy, having totally lost the elegance for which it is remarkable in its more typical state when growing on gravelly and sandy places, and would hardly be known as the same plant, but probably be taken for a state of *A. patula*. This latter state is frequent above the bridge at Berwick. I have noticed the present plant in Guernsey, at Shoreham, near Liverpool, and near Newhaven, Edinburgh. It has also been found on other parts of the coast.

2. *A. ERECTA*, *Huds. Fl. Ang.* ed. i. 376. *Eng. Bot.* 2223. *Eng. Fl.* iv. 294. *Hook.* 379.

β . *STRICTA*, *Bab. Mss.* Stem herbaceous, erect, the branches ascending; lower leaves ovate-oblong, cuneate at the base, irregularly sinuato-dentate, upper ones lanceolate entire; fruit-bearing calyx rhomboid, acute, denticulated, submuricated on the back, scarcely larger than the fruit; spikes compound, many-flowered; seeds smooth and shining.

The *A. erecta* of Hudson is known only by a single very imperfect specimen in the Smithian Herbarium, and which differs from our plant by having smaller fruit, and the enlarged calyces strongly

tuberculated. The present species differs remarkably from both *A. patula* and *angustifolia*, by its densely flowered compound spikes; those plants having long simple interrupted spikes. It is also distinguished from the former, by its smooth, shining, and much smaller seeds, and the shape of its leaves; from the latter, by its denticulated calyx and great difference of habit.

This plant is not uncommon throughout England and the south of Scotland. I noticed it in Holy Island, and also near the Town of Berwick, in great plenty.

3. *CHENOPodium BOTRYOIDES*. *Sm. Eng. Bot. t. 2247.*

I gathered this plant in Holy Island, in company with Dr Johnston, in September last, and have compared the specimens with others from Lee Pool, Cornwall, with which they exactly agree.

4. *SILENE NOCTIFLORA*. *Linn.—Eng. Bot. t. 291.*

We also found a few specimens of this plant during the same visit to Holy Island.

5. *POTAMOGETON PLANTAGINEUS*. *Du Croz (in Gaud. Fl. Helv. i. 471, tab. 3.)* Leaves all membranous, stalked, rather opaque, blunt, entire, lower ones oblong, upper elliptical; nuts minute, obliquely ovate, rounded on the back (when fresh); spike slender, cylindrical, densely flowered, on a long terete peduncle. *Roem. and Sch. iii. 504. Reich. 24. Bert. Fl. Ital. ii. 232. P. coloratus, Horn. in Fl. Dan. 1449, Cham. in Linnæa, ii. 194, t. 5, f. 15; P. Horne-
manni "Meyer Flor. Hanov. 521;" Koch Syn. 674.*

Differs from *P. natans* by its beautifully diaphanous reticulated leaves, none of which are coriaceous, and its much smaller fruit; from *P. oblongus* by its leaves, and the acutely heeled back of its dry fruit; in that plant it is always obtuse.

A specimen of this species exists in Dr Johnston's Herbarium, gathered by Dr R. D. Thompson, at Ferney Rig marsh, Berwickshire. It has been found in several parts of England.

Hoping that these few notes may be acceptable to your Club, believe me, &c.

CHARLES C. BABINGTON.

Address to the Members of the Berwickshire Naturalists' Club, delivered at the Anniversary Meeting, held at Millfield, 18th September 1839. By the Rev. T. KNIGHT, Vicar of Ford, President.

GENTLEMEN,

I believe the rules of this Club, and the example of those who have before been honoured with the office which I now unworthily fill, leads you to expect from me, before resigning this chair, some account of the transactions of the Society during the last twelvemonth; and this I have much pleasure in proceeding to do, more especially as I shall have to speak of the labours of others, not of my own.

The last Anniversary was held at Ford 19th September 1838, when the following Members attended: Dr Clarke, President; Dr Johnston, Dr F. Douglas, Rev. T. Knight, Rev. John Baird, Mr Embleton, and Mr Darling. Messrs. Blackden and Knight, jun. were present as visitors.

The day was clear and cloudless, and the party, after breakfasting at the Rectory, sallied forth in high spirits to enjoy, from the hill above the village, the extensive prospect, rendered peculiarly interesting by the solemn towers of Ford Castle immediately below them, and the more distant view of Flodden Field,—that spot so famed in History, and so memorable—once the scene of deadly strife, and stained with the best and bravest blood of two hostile nations,—now covered with peaceful flocks and golden corn-fields. The ruder times of our forefathers, thank Heaven! have passed away; and now parties, from the two countries, can meet for other purposes than that of bloodshed—to contemplate and admire together the works of the Great Creator and Father of them all.

The first point to which attention was particularly directed was a sandstone quarry, situated in Ford Hill, where numerous specimens of *Lepidodendron* were observed, some *in situ*, lying in a nearly horizontal position, but with a slight inclination to the south east. The *Lepidodendron* was surrounded by a ferruginous crust, which had partly mouldered away.—The walk of the members thence was across Ford Common, in the direction of Woodend copse. *Gentiana campestris* was observed abundantly on the Common, some specimens of which were gathered in flower, which did not exceed half an inch in length. At the top of the Hill, previous to entering upon the natural wood at Woodend, there is a peat-bog, where the usual denizens of such spots were observed, but none of such rarity as to require a record here.

Woodend consists of about 150 acres of natural wood, situated on a declivity facing the north. The wood is mossy and full of springs. Here was a large field for the observer of nature to explore. Plants, insects, &c., were numerous. The following among others were ob-

served:—*Betonica officinalis*, *Bromus asper*, *Myosotis caespitosa*, *Rubus fruticosus*, *corylifolius*, and *idæus*; *Veronica montana*; *Viburnum opulus*; and *Cantharellus cibarius*. The latter esculent fungus was collected in considerable abundance. A portion was dressed for dinner, and was perhaps relished by those who partook of it. The flavour of the apricot was distinctly marked.

After leaving Woodend, the party proceeded towards the Routing Lynn, across Ford Moss, which is an extensive tract of peat-bog covered with heather, *Myrica gale*, &c. A beautiful lizard (*Zootoca vivipara*) was taken. The day being now far advanced, the party were reluctantly obliged to return to the Inn without visiting the Routing Lynn, whither they had intended to go in quest of the Royal Fern, which had been reported to have a habitat in that sequestered spot. On returning, a variety of *Calluna vulgaris*, with densely pubescent foliage, was observed in very large patches, intermingled with the common heather. The flowers of the pubescent variety were of a paler cast, and less withered than the other. *Aspidium dilatatum*; *Euphorbia exigua*; *Gnaphalium minimum*; *Cistus helianthemum*; *Juniperus communis*; *Solidago virgaurea*, &c., were noticed; and *Artemisia absinthium*, in considerable abundance in the vicinity of the village.

After dinner, Dr Clarke read the Annual Address, and the Rev. T. Knight was elected President for the ensuing year. The evening was spent as usual in interesting conversation, until the approach of darkness reminded some of the party that they had many miles to travel before the labours of the day were over.

At the December Meeting, which was held at Berwick, nothing was done beyond transacting the usual business of the Society, and fixing upon the places of rendezvous for the ensuing summer.

The next meeting of the Club was at Chirnside, May 1. 1839—as beautiful a morning as ever ushered in that month. The number of members present, notwithstanding the loveliness of the morning and the beauty of the spot selected for the meeting, were only Mr Selby, Rev. T. Riddell, Dr Johnston, Dr Clarke, and Dr F. Douglas. The party were afterwards joined by the Rev. Mr Wilson, and Mr Henderson, surgeon, and felt much indebted to the latter gentleman for conducting them to the most favourable ground for observation. Their course was along the romantic wooded banks of the Whiteadder, where all the early spring flowers were in profuse blossom. Insects were tolerably abundant, and Mr Selby was successful in capturing several rather rare species—of which the following is a list:—

Elaphrus cupreus.
Byrrhus sericeus.
Cassida rubiginosa.

Stenus bimaculatus.
Coccinella 5-punctata.
Helophorus Fennicus.

Helophorus granularis.
Hydroporus alpinus ?
Peryphus tibialis.
Peryphus saxatilis.
Peryphus littoralis.
Notiophilus biguttatus.
Hydrobius bipunctatus.
Hypera nigrirostris.
Anthonomus Ulmi.
Phaedon concinna.

Haltica rufipes.
Tachys pusillus.
Lesteva caraboides.
Stenus oculatus.
Stenus pusillus.
Stenus lævis.
Lathrobium rufipenne.
Philonthus rubripennis.
Tachinus apicalis.

Several Planariæ, and ova, or spawn, of various fishes and insects, were procured from beneath the stones in the shallow channel of the river. *Viola hirta* was found in full and luxuriant blossom, thereby adding another to the already numerous localities of this species in Berwickshire; which had been considered by Sir W. Hooker as of very rare occurrence in Scotland. *Symphytum tuberosum* was likewise observed in considerable quantity, but not in flower. A rather singular twist, resembling in shape the top of a saddle, was observed in the limestone rock about a mile above Ninewells House, on the east side of the river. Beneath a projecting slab of this rock, a considerable quantity of acicular crystals of saltpetre was collected.—After dinner, Dr F. Douglas read an account of the recent drying up of the river Teviot, and explained, to the satisfaction of the party, the probable cause of such a singular phenomenon.

The Rev. Mr Wallace forwarded his annual summary of observations of the barometer, thermometer, and hygrometer, made at the manse of Abbey St Bathans's, in 1838. By this table it appeared that, notwithstanding the unusual severity of the months of January and February in that year, the mean temperature for the year only averaged about $1\frac{1}{2}^{\circ}$ F. lower than the previous year.

Mr Selby read a very interesting paper on the effects which the winter of 1838 had produced upon animal and vegetable life. Mr Selby also read an account, and shewed a drawing, of a curious aquatic Larva found in a water jug at Twizell. It was chiefly curious on account of the unusual means which it employed to convey food to its mouth. On each side of the mouth extends a number of bristles, which diverge and open like a fan, and which appeared to be put in motion by two small clickers at their base. In this manner the food is brought to the mouth of the Larva. It unfortunately died previous to undergoing a metamorphosis.

On the 19th June the Club met at Coldingham. There were present Rev. T. Knight, President; Rev. T. Riddell; Dr Johnston; Rev. J. Turnbull—who were joined by the Rev. Mr Tough; Rev. Mr Robertson; Mr M'Laurin, jun., and the Rev. Andrew Thomson as visitors. The latter gentleman was subsequently admitted a member on the nomination of the Rev. Mr Turnbull, seconded by Dr Johnston.

The morning walk was directed to and over St Abb's Head—thence to the Loch—and homewards to Coldingham. The excursion was a most agreeable one, from the loveliness of the weather, and the beauty and grandeur of the scenery, which, though often visited by various members of the Club, was viewed with new and undiminished admiration. It is unnecessary for me to give any description of it, as this has been done on a former occasion by Dr Johnston. Nothing new was observed in the course of the walk, but the sight of many and familiar friends gave rise to a varied, and it is hoped not an unentertaining conversation. The flowers which constitute the enamelled turf of the Head were in great beauty, but no additions to its flora were made. The *Polyommatus Alsus*, and *P. Artaxerxes*, two pretty and rare Butterflies, were observed flying in considerable numbers on the Head, as well as on the banks of the Loch; and a few specimens were captured for the gratification of our Entomologists. *Balea fragilis* and *Pupa marginata*, with other more common shells, were found in great profusion in the crevices of the rocks on the Head which overhang the sea.

Dinner being over, the minutes of the preceding meeting were read; after which Dr Johnston laid on the table a descriptive catalogue of the Berwickshire Cephalopods; and the Rev. T. Riddell read an essay on the early stages and development of the common *Balanus*, confirming, in a great measure, the statement of the metamorphoses of the animal published by Mr Thompson. There was also exhibited a living specimen of *Uria Grylle* or Black Guillemot, which had been shot two days previously on St Abb's Head, and which probably had come from the Isle of May, where it is known to breed.

The members, then, in company of the excellent minister of the parish, visited the old church, so celebrated in history; and having partaken of tea at the Inn, separated, apparently gratified with the day's work.

The July meeting was at Birgham; members present, Rev. T. Knight, President; Rev. J. Baird; Rev. G. Cunningham; Dr Johnston; Rev. Andrew Baird, and Mr Knight, jun. of Ford, as a visitor. The day was unfavourable, but after breakfast, the members, as usual made an excursion with a view of gaining some acquaintance with the neighbourhood. Their course was first directed to Birgham Haugh, where, it was said, that *Euphorbia Esula* grew in abundance, and perfectly wild, but the members soon satisfied themselves that this was a mistake, and that the place on which it grows had been, at no remote period, the site of a garden or shrubbery, and where still "many a garden flower grows wild." After this the members traced the course of the river downwards, and although several plants of comparative rarity were noticed, the only one which had not been registered as a native of the county was *Sanguisorba officinalis*, that grew, very sparingly, on a piece of ground liable to be overflowed by every flood

of the river, and hence an uncertain and mutable station. Having nearly reached Fireburn Mill, the party returned to Birgham, in order that they might pay their respects to the Misses Bell, but they were disappointed of that pleasure, as neither of those ladies was at home.

The walk was now directed northwards to Ferney-rig Marsh, where the only plant of rarity noticed was the (*Enanthe Phellandrium*).

After dinner, the minutes of the preceding meeting having been gone over, a list of plants new to, or of rare occurrence in Berwickshire, found by Mr Hardy of Penmanshiel was read; and the Rev. Mr Cunningham gave orally a sketch of the early history of Professor Robertson, which he was requested to put upon paper for the use of the Club.

Specimens of *Centaurea scabiosa*, gathered at Sprouston, Roxburghshire, but on the very limits of the county, and close to Berwickshire, were exhibited by the Rev. John Baird.

Such is a slight sketch of the proceedings of the Society during the last year, so far as the minutes of our worthy secretaries have made me acquainted with them. And now, in conclusion, I trust I may be permitted to express a hope that those distinguished members of the Club, who were the chief instruments in bringing it into existence, and have since continued its useful operations, will persevere in their interesting researches. With respect to many amongst us, indeed, it may be said that we are living on the labour of others—that the advantage is all on our side, as we have as yet done nothing towards extending the information of the Society: this we feel to be indeed too true. But still we trust those gentlemen whose taste and talents qualify them in an eminent degree for pursuing the object of the Club in a scientific manner, will neither grudge us the pleasure we derive from the meetings, nor the instruction we gather from their conversation.

To them, however, there is every encouragement held out—in the success of their labours hitherto, and in the wide and diversified field which Nature has spread before them. We doubt not that in Natural History, as in every other branch of science, much remains yet to be explored, and who knows what fresh wonder it may be the lot of some member of this little society to bring to light. But, however this may be, the study of Natural History, and the pursuit of it in the manner adopted by this Club, is not only a source of innocent and rational amusement, but a useful and delightful exercise of our reasoning faculties. And the great Creator of the Universe never spread his works around us in such varied abundance that we should pass them by without observation, or without endeavouring to draw from them lessons of wisdom, and fresh motives to adoration and praise. He seems indeed to have stored his works with treasures on purpose that the mind of man might explore and develope them; and he seems expressly to have concealed many wonders from the view of his creatures,

in order that their curiosity might from time to time be enkindled, their vigilance awakened, and their mind restless, till they have improved its powers, and thoroughly investigated the great and mighty whole. Only let us keep carefully in mind that the advancement of science is not our sole object, but that we have a nobler result in view—the praise and glory of the Almighty Framers of the Universe;—then we shall have the satisfaction of feeling that we are not forgetting duty in the midst of pleasure; that even in our hours of relaxation from the graver callings of life, we are walking piously with our God.

Notice regarding the Cessation of the Flow of the River Teviot, 27th November 1838. By DR DOUGLAS, Kelso.

THE temporary cessation of flow and drying up of the River Teviot in November last, excited very considerable interest amongst the scientific world generally, but more particularly in the South of Scotland, where the phenomenon occurred. Unfortunately for my description, I was not an eyewitness to the occurrence, but the following facts were gathered with the greatest care, and their correctness ascertained.

The first intelligence which I had of the drying up of the river, was a paragraph in a local newspaper announcing the fact, and likewise the contemporaneous occurrence of the phenomenon in the Rivers Clyde and Nith. My first impression was that no common cause could account for the phenomenon, and that, in all probability, it could be produced by nothing short of an earthquake extending over a large surface of ground, so as to comprehend all the springs which fed those rivers. In the sequel we shall see what evidence exists in support of such a theory, and what other conclusion the following facts would lead us to adopt.

I shall first, then, state the facts which I have ascertained, and secondly, endeavour to give the proper solution of them.

1. The scantiness of the stream of water in the mill-lead above Maxwellheugh Mill, situated about 50 yards above the confluence of the Teviot with the Tweed, was first observed by the miller at 6 A.M., Nov. 27. 1838. His attention was directed to it in consequence of the stopping of the wheel from a deficiency in the volume of water which was required to keep it in motion. The supply nearly ceased altogether at 8 A.M. On examination, the whole of the water in the river was found to be diverted into the mill-lead by means of a *cauld or wear*, stretching across the body of the stream, but the whole of this quantity was insufficient to keep the mill-wheel in motion. Between the hours of 8 A.M., and 12 mid-day the bed of the river was perfectly dry. Many individuals walked across without wetting even the soles of their shoes. The trouts were scarcely covered in the small pools which remained, and were easily captured by the hand. About 12, the flow of

water began to increase, and at 1 P. M. was so completely established that the river assumed its ordinary size. The miller informed me that the supply increased gradually, and did not come *in a rush*. The mills at Roxburgh, Heiton, and Sunlaws, situated from two to three miles above Maxwellheugh, were similarly circumstanced. The following fact is curious. At Ormiston, five miles from the mouth of the river, there is a cauld, facing the north-east. Against this cauld, a keen cold wind blew directly, and by the combined influences of the wind, and a tolerably intense frost, a regular wall of *ice*, consisting chiefly of ice attached to the stones and *grew*, was formed behind it across the river, which completely obstructed the flow of the water over it, which consequently rose to the height of nearly two feet in a pool above, nearly a mile in length. The mill at Ormiston never ceased to revolve, as the miller broke the ice communicating with the sluice, and the ice collected against the cauld. Near mid-day, partly by the enormous pressure *a tergo*, and partly by means of the solar influence, this barrier gave way, and permitted the flow of the water downwards.

A mill at Nisbet, three miles higher than Ormiston, also stopped for want of an adequate supply of water.

At Minto, fourteen miles from Kelso, the river was observed in the morning to be nearly dry. During the forenoon, there was a partial rise above its usual level, which, however, soon subsided.

I regret that I have not been able to investigate fully the particulars respecting the state of the river at this point.

At Hawick, six miles farther up, I am informed by a correspondent, that, during the morning and forenoon, the mills were stopped for want of their usual supply of water, and that near mid-day the supply was established, and the mills again at work. For several miles above Hawick, the river was remarkably small, and the same appearances were observed in its tributaries.

The bed of *Rule* water, near its junction with the Teviot opposite Minto, was perfectly dry. Several mills upon this stream were obliged to cease their operations for several hours; but the mill highest on the river, about a mile from its sluice, never was interrupted from any deficient supply. My friend in Hawick mentions, that during a severe frost, the river there is frequently as small as on the late occasion, that it excites no surprise, and is universally attributed to frost. The thermometer, during the night of the 26th, and morning of the 27th November, fell rapidly to 27° F. The river Tweed at Kelso, was nearly frozen across, and an immense quantity of *grew*, *incompact ice*, floated down throughout the whole day. The wind was very high from the north-east. The barometer 30°.5.

The drying up and cessation of the current of rivers, is not a new occurrence in the south of Scotland. The same thing has been frequently observed and recorded during the last century, and has happened, I find from inquiry, several times since the commencement

of the present. In January 1748, March 1785, and January 1787, the same phenomena were observed in the Teviot; and on the two former of these occasions, the drying up took place near the mouth of the river. The following extract from the *Gentleman's Magazine*, for March 1748, will be read with interest.

“Letter from a gentleman in Scotland, February 29th.—Mr Urban, we have had some extraordinary events in our neighbourhood, which can't as yet be accounted for. On January 25th the river Teviot, for two miles before it joins the Tweed, stopped its current, and its channel became dry, leaving fishes, &c. on dry ground, many of which were taken up by the country people, and sold at Longtown, and other places. It continued in this condition for nine hours, and when it began to resume its course, it began gradually until it ran as usual again, but in no greater quantity from its stopping as might be expected. How to account for the phenomena we know not, for there are no mines of any sort, nor any cavities in the whole country; and, if the waters had been stopped by any rising of that part of the ground, by an earthquake, they would have been heaped up in such quantities in a minute's time, that upon the ground's descending, the whole country must have been overflowed.

On February 19. the river Kirtle was dry for six hours.

On February 23. the river Esk stopped its course, and the channel was quite dry for the space of five hours, to the admiration of the whole country.”

But similar phenomena have occurred in much more recent times. A gentleman informed me that during the winter 1803—4, the river Teviot was dry; and on Eastern's evening 1824, I was assured by the miller at Roxburgh that the river was even drier than on the 27th of November. The previous night's frost having been intense, about eleven in the forenoon when the sun got out, the river began to flow as usual. On the 27th November the Tweed was scarcely perceptibly smaller than usual. An enormous quantity of grew floated down during the whole of the day. On the 28th of January last, after a frost of considerable intensity, another stoppage occurred in the Teviot, but not to the same extent as on the 27th of November.

A few observations will now be necessary to attempt an explanation of the above phenomena.

Running water is always in the lowest ground in the district, and its tendency is uniformly to cut into the earth as deep as its level will permit. From this it may be inferred, that it will frequently interfere with the course of springs, or in other words, that many springs must have their vent on the very verge, or in the bed of the stream.* In severe drought or in sharp frost, the open springs at any distance from the lowest level never reach it, and the supply of the stream is altogether kept up by the water rising within its own bed. In a lake, where there is no outlet,

* The springs being universally directed towards the latter.

the common laws of heat and cold influence its freezing, and deep water never congeals until the whole mass is brought to the freezing point. In our most northern settlements, Hudson's Bay for instance, stagnant water is known to freeze to the depth of ten or twelve feet, and all the fish are frozen along with it:—not so in the rivers—the surface is frozen indeed, but the ice then becomes a protection to the running water beneath, from the greater cold of the atmosphere. It is quite evident that in all running streams, the falling down of the colder, and the rising of the warmer water cannot take place with any uniformity, for the movements of the current prevent the regular action of heat and cold, and the discharge of the springs into the channel of the river from a greater depth than the frost penetrates, keeps the water still moving freely below the surface of the ice.

To explain the singular phenomenon of the stoppage of mountain streams, it is necessary to consider how they usually flow. Where rocks abound and the channel is alluvial gravel, every one, conversant with Highland scenery, is aware how the rivulet meanders almost in circles, forms a succession of streams and pools, and at every turn creates a natural weir, extending from side to side at oblique angles. The pools discharge themselves at their lower extremity, over these natural weirs, which again forms the head of the streams below, and the streams again terminate in pools, and so on in succession, till the enlargement of the stream renders the natural weir less observable.

Let the wind come from any point of the compass, it must blow directly in the face of a great number of these banks of sand and gravel, will stop the descent of floating ice, and materially assist in freezing it into a more solid mass. It will make the stoppage more easy in the natural weirs below, by diminishing the current of water until it ceases to flow altogether. To produce this, it is possible that frost alone may be sufficient, but to do it more effectually, wind in addition would appear to be requisite. Now this actually was the case during the night of November 26-7. The phenomenon which occurred at Ormiston could shew, in a remarkable manner, how far the effect may be carried; but the stoppage of the rivers must be sought for in the natural weirs, where the frost, fixing on the shallow bottom, forms a ground-ice, and then catching the light floating grew, makes a chain of obstructions, while the stream being stopped, there is time for the ice to form a covering on the surface of the pools. After a time, which will be longer or shorter according to circumstances, the springs will force these barriers, and the flowing water will resume its course. If there is a tendency to fresh weather, the stream will be increased in volume according to the duration of the previous stoppage, as was the case on the afternoon of November 27. and the following day, in the Kale and the Teviot. If the frost continues, the waters again flow beneath the ice, although cut off from any other supply than what the natural channel of the brook receives from the springs

which open into it. This kind of obstruction can scarcely take place in a very flat country, because the waters have higher banks and fewer streams, and of course few natural weirs, and because the boggy ground through which they flow, affords a natural protection to the springs upon their banks from the roughness of the herbage. This accounts for the rivers Eden and Leet not being subject to such a stoppage. This principle is well known and acted upon by gardeners and farmers—the former putting rough grass or straw over his tender vegetables in winter, and the latter in frosty weather ploughing his roughest pasture, when bare ground is quite impenetrable. This appears to be the most probable explanation of the phenomenon, but at any rate there can be no doubt of frost being the agent; and the dryness of the channel can only be occasioned by the water running off while the supply from above is withheld.

On the Effects produced upon Animal and Vegetable Life, by the Winter of 1838. By P. J. SELBY, Esq. of Twizel House.

THE severity with which the year was ushered in by the long continued frost during the months of January, February, and a part of March; the cold and long retarded spring, succeeded by a chilly and ungenial summer, as well as a late and deficient harvest, place the year 1838 upon our records as one of peculiar, though happily of unwonted character. Under circumstances of such a nature, and which it is more than probable, may not again occur during the limit of the present generation, a few observations upon the effects of so severe a season, as connected with animal as well as vegetable life, more particularly as affecting our own district, may perhaps prove not altogether uninteresting to the members of the Club. It will be in the recollection of those who attended to the weather, that, up to the 5th of January 1838, the season, with the exception of the first week of the previous November, when we experienced a severe but cursory snow storm, had upon the whole been temperate and mild: this was particularly the case on Christmas, and two or three following days, when the thermometer ranged from 52° to 55° , at which time, I may remark, many of the thrushes which still remained inland, were heard recording in distinct and audible key, thus flattering us with the hope that winter had divested herself of her characteristic garb, and that these sweet carols were to be the prelude of an early spring. These halcyon days, however, were of short duration, as, on the 6th of January, frost set in, accompanied in this district by showers or falls of snow and hail, which, in consequence of the calm state of the atmosphere, fell level upon the surface. It thus continued falling at frequent intervals, more or less, for nearly a fortnight, when the snow

had accumulated to the depth of ten or twelve inches over the whole surface of the country, the frost, at the same time continuing to increase in intensity, till every brook and pool was locked up in ice and frozen snow. In consequence of this deep covering the birds, particularly those of the insectivorous tribe, or whose chief pabulum consists of worms and insects, soon began to feel the effects of famine; and blackbirds, redbreasts, hedge-sparrows, &c., were reduced, at a comparatively early part of the storm, to a deplorable state of weakness, and were daily found dead or dying from the combined effect of hunger and cold. Many fieldfares also perished at this early stage of the frost, though the great body of this migratory species, soon after the commencement of the storm, moved southwards; the thrushes also, which I have previously observed were singing at Christmas, entirely disappeared, a precaution I have observed for many years to take place in regard to this species, whenever a storm or frost of any continuance has occurred. I may remark, that, previous to the commencement of the storm, all the haws and other berries which are the occasional food of the thrush tribe, had been devoured by them, so that no resource of this nature was left them to fly to when the frost first set in. About this period of the storm, that is, after a fortnight's continuance, the arrival of a great variety of the rarer kinds of water-fowl along the line of coast proclaimed the intensity as well as the wide extended range of the cold. Wild swans then made their appearance in flocks, and for two or three weeks several of these birds took up their residence in Budle Bay, when, as may be supposed, their unwonted presence caused an active pursuit, and many individuals were shot. Among them, I may mention two that were taken alive, having been wounded, but only so as, in conjunction with their reduced condition, to incapacitate them for flight; these soon became very tame, and were afterwards placed by W. B. Clark, Esq., of Belford Hall, in a piece of water, where one of them continues to thrive, and now associates with a common goose; the other died during the course of the summer, apparently from the effects of some internal wounds it had received. Both of these were of the common or elk species (*Cygnus ferus*), nor did any specimen of *Cygnus Bewickii* come under my observation, though I am aware that a few individuals of this species were taken in other parts of the kingdom. In other districts of the country, and in the south of England, the destruction of these beautiful and noble birds was very great. Among the rarer species of water-fowl killed upon our coast, the following are deserving of notice. *Larus minutus* (little gull) near Embleton, the first instance, I believe, of its occurrence upon the Northumbrian coast; this is now in the possession of our brother member, Mr R. Embleton. Several specimens also of the *Mergus albellus* (Smew), in the adult male plumage, in which state it is considered a rare bird, were killed upon different parts of the coast; and

of *Podiceps rubricollis*, far from a common species, I saw several instances. Many specimens of the different Colymbi (divers) were also shot, and wild-ducks, wigeons, brent geese, scaup-ducks, pochards, tufted-ducks, and golden-eyes, were very plentiful. Upon the southern coasts of England an equal or even greater influx of water-fowl took place, and the destruction as may be conceived, was comparatively great. In Hampshire, I am informed, that a noble sportsman, who rented a small part of the coast expressly for the shooting of wild-fowl, killed during the storm, the extraordinary number of 515 head of various kinds, among which were thirty-seven swans. This warfare upon the aquatic tribe continued for six or seven weeks, and it was not till the middle or latter end of March, that the wild-fowl began to shift their quarters, or yield to that influence which directs their migratory movements to the higher latitudes on the first approach of spring. Before a thaw took place, many of our hardy indigenous and resident land birds also suffered from the intensity of the frost and the want of food; partridges and pheasants were found dead in every direction, and even the hardy muirfowl upon the higher grounds were many of them frozen to death. In Edinburgh, I am informed, that for weeks, after the first ten days of the storm, baskets full of partridges and other game were brought to the poulterers, which had died or had been caught in a dying state, and when taken into the hand were found so reduced as to be a mere collection of bones and feathers. Four-footed game also did not escape with impunity, and during a great part of the storm, their only food, in this district, was the bark and twigs of such underwood and young trees as appeared above the snow. But it was not in those districts alone in which the snow lay deep upon the surface, that animal life suffered from the severity of the season, for I find that in Dumfriesshire and other parts along the western coast where the fall of snow was very trifling, and scarce whitened the surface, great mortality nevertheless prevailed amongst the feathered race, all access to food having been as effectually prevented by the stony hardness of the earth, as it was where the hoary covering hid every thing from view.

We now turn to the effects of the frost upon the vegetable fibre, and here we find evidences of its intensity equally striking, and as fatally injurious to certain plants, as it was to animal life. In this district its severity was plainly demonstrated by the appearance of our hardy native, the common whin; this shrub, wherever fully exposed, or in so far as it remained uncovered by the snow, was completely destroyed, for a proof of which I have only to evidence its unsightly appearance at the present moment. The common bay and Portugal laurels also suffered severely whenever exposed to the south-east blast, and many of them still remain in a dubious state of existence. The laurustinus, which had flowered and grown luxuriantly for many years past in this district, has most of it been destroyed to the root;

and, I find, that even such plants as remained partially green during the last summer, in consequence of some slight nourishment from the stem, are now all withered and dead, a result, however, I had anticipated from the appearance of the bark when it was examined last spring after the melting of the snow. In the midland and southern parts of England, where a still greater degree of cold prevailed, as indicated by the thermometer, and where no protection was afforded by a deep covering of snow, the destructive effects of the frost were more extensive, and few, except the hardiest evergreens, escaped without more or less injury, some being killed outright, others destroyed to the root, or totally denuded of their leaves; and it so happened that many shrubs and trees, which in the north of England and Scotland shewed but trifling symptoms of injury, were, farther to the south, unable to resist the rigour of the cold. Thus, in a few short days, or perhaps hours, perished most of those beautiful evergreens and other ornamental shrubs which add so essentially to the elegant appearance of our country residences, and which form so prominent and peculiar a feature in English ornamental gardening; many of these had attained a growth of thirty or forty years, and were flourishing in the greatest perfection, having braved our usual winters without suffering any material injury. The loss, I may add, is still more severely felt, as time alone can repair it; and it is only the young and rising generation who can, even under the most favourable circumstances, again expect to behold a new succession equal to that which perished in the winter of 1838. Among the evergreens which shewed an aptitude to bear an unwonted degree of cold uninjured, or only injured to a trifling extent, the Holly, the Rhododendrons *Ponticum*, *Catawbiense*, *ferrugineum*, &c., the Yew, Box, Arbor Vitæ, and the Red Virginian Cedar, stood conspicuous; the Portugal Laurel also, except in very exposed situations, was not materially injured, and the common or large bay-leaved Laurel, in our own premises, escaped in most instances with the loss of the tender part of the shoot of the preceding season. Of the degree of cold experienced during the continuance of this storm, we have authentic accounts of the thermometer having descended to 4° and even 7° below zero, or 36° and 39° below freezing, in the midland and southern parts of the Island. In this and adjacent districts it does not appear to have reached this intensity, the following being observations on which dependence can be placed. At Kelso, 140 feet above the sea-level, it fell to 3° F. on the night of the 21st January 1838, and during the continuance of the storm was frequently observed at 5° and 8° F. At Mellerstein, about 500 feet above the sea, a self-regulating thermometer of Adie's marked it at 2° F. during the nights of January 20 and 21, 1838. At Greenknow, near Gordon, and considerably higher than Mellerstein, 3° F. on the night of 21st January. And at Mertoun House about the 14th or 15th January, a common thermometer was observed 2° F., and again on the morning of

January 21. at 2° F. Early in March the frost abated in rigour, and a slow thaw began to melt the vast accumulation of snow which had been drifted into the lanes, hollows, and hedge banks by the severe and oft-repeated gales that had occurred during the two months frost. Up to this period none of those indications which we had been accustomed to hail as the harbingers of spring had been observed, such as the song of the missel-thrush and the mavis, the cooing of the ring-dove, or the pipe of the golden plover, which in usual seasons seldom fail to greet our ears with their welcome notes before February has advanced into the second week. On referring to my notes I find it was not till the 5th and 6th of March that the peawit and golden plover were first seen, or the carol of the lark heard; on the 7th the thrush and missel-thrush were in song, being a period later by nearly a month, than any I can find in a register kept for many years past, and it was not till the 20th that the congregated flocks of the ring-dove began to disperse, or that they were heard cooing and exhibiting that peculiar flight which distinguishes the species at the time of pairing, and which in ordinary years seldom fails to occur before the 8th or 10th of February. It was now that the effects of this long-continued storm, so remarkable for the great degree of cold that accompanied it, became fully apparent; for instead of the host of birds that were wont to resort to our groves and plantations at this season, and whose "wood-notes wild" used to greet us in every direction, a few individuals or a solitary pair alone were to be seen, and where, a season or two before, a united concert of a multitude of thrushes might have been listened to on a calm mild spring evening, not more than two or three at far distant stations could now be heard; of our familiar attendant the red-breast, few survived to pour forth their impassioned lay, as the diminished numbers of this favourite bird, even after the increase of the year, clearly demonstrates. The same may be said of the blackbird, whose mellow whistle was scarcely recognised during the spring and summer; and a like falling off was observed in regard to the wagtails, wrens, and indeed all the indigenous insectivorous species, which suffered to a much greater extent than the Conirostræ or Finch tribe, which, subsisting upon seeds and grains, found, if not ample, at least a sufficient quantity of food to support life in the stack and fold-yards where the others were perishing from the effects of hunger and cold. But the deficiency of the feathered tribe this year, I afterwards ascertained, was not confined to our indigenous or permanent residents: it extended to all those species which we call summer visitants, or which make our island their breeding resort and habitat during their Polar migration; for as the time of the arrival of the various species successively occurred, I found that throughout this district their numbers scarcely averaged a third of the usual supply, and this falling off not confined to a few particular forms, but extending to all the migratory species.

The same was observed to prevail in the south of England, as in a communication from Mr Yarrell, he mentions that the paucity of summer visitants had been generally remarked by those who interest themselves in ornithology and observations connected with it. The cause of this deficiency I attribute to the very cold and ungenial weather which prevailed not only throughout Britain, but over a great portion of the European Continent, at the time these birds usually undertake their periodical flights, and which, I imagine, stopped many on their course, and prevented that extended movement which, in ordinary years, permits their reaching our own and even higher latitudes. That their lessened numbers arose from causes which affected them during their winter sojourn can scarcely be supposed, as that portion of the year, it is now well ascertained, is passed by most of them in the warm region of the African Continent or in those parts of Southern Europe, where frost is scarcely known. Some few may undoubtedly have perished on the way, or from having advanced at too early a period into the north of Europe, where, in consequence of the chilling cold that prevailed, no appropriate food could be found, and thus died of hunger; but the more probable reason is, I think, that already assigned, viz. that they were stopped on their advance by the peculiarity of the season, and were compelled to remain and nidificate in lower latitudes than they are generally accustomed to do. Of the few which did arrive, it was observed that their first appearance was nearly a fortnight later than has generally been the case, upon an average taken from a register of some twenty years past. Thus I find that the *Willow Wren* (*Sylvia trochilus*), instead of the 16th or 18th of April, was not seen or heard before the 3rd of May; the same in regard to the *Blackcap* (*Curruca atricapilla*), the *Tree Pipit* (*Anthus arboreus*), the *Whinchat* (*Saxicola rubetra*); and the 13th of May had arrived before an individual of the *Fly-catcher* (*Muscicapa grisola*) was observed. Of the species just enumerated, a deficiency, such as I have already mentioned, was remarked; but I think it was even more striking in others, among which I may particularize the *Sedge-warbler* (*Salicaria phragmitis*), *Greater Petty-chaps* (*Curruca montana*), *White-throat* (*Curruca cinerea*). To this cold and long-retarded spring, succeeded a short and, with the exception of a few days in July, a moist and chilly summer, circumstances which affected not only the increase of animal life, but produced the more serious calamity of a deficient harvest. Fruits also did not ripen at all, or very imperfectly, and were devoid of their proper taste and flavour. In conclusion, I may add, that a great deficiency of the insect tribes was generally remarked, and, from having given a considerable degree of attention to the entomology of this district for some years past, I can confidently say, that in most of its great families or divisions the remark is correct, more particularly as it applies to the Coleopterous and Lepidopterous insects, upon a comparison with what was observed in 1835 and 1836, as well as years previous to that date.

Summary of Observations of the Barometer, Thermometer, &c. for the year 1838, made at the Manse of the Parish of Abbey St Bathans, Berwickshire, Lat. 55° 52' N. Long. 2° 23' W., at the Height of about 450 feet above the Sea. By the Rev. JOHN WALLACE.

1838.	MONTHS.	THERMOMETER.					HYGROMETER. (Leslie's.)					BAROMETER. (At 32° of Fahrenheit.)					Temperature of Spring Water.	Mean Point of Deposition.	Grains of Mois- ture in a Cubic Inch of Air.	Relative Hu- midity.	Rain in Inches.			
		At X. A.M.	At X. P.M.	Mean.	At IX. A.M.	At IX. P.M.	Mean.	At X. A.M.	At X. P.M.	Mean.	At IX. A.M.	At IX. P.M.	Mean.	At X. A.M.	At X. P.M.	Mean.								
	January,	29.1	26.7	27.9	28.1	29.5	28.8	0	0	0	0	0	0	29.379	29.397	29.388	29.382	29.358	29.370	46	27.7	.00114	1000	3.325
	February,	28.4	27.8	28.1	27.4	30.8	29.1	1	1	1	1	1	1	29.101	29.091	29.096	29.101	29.077	29.089	45½	27.5	.00114	983	2.520
	March,	38.7	36.1	37.4	37.2	40.7	39.0	4	1	2.5	3	7	5	29.129	29.154	29.142	29.142	29.119	29.131	45½	31.7	.00131	826	3.078
	April,	41.2	36.7	38.9	39.0	42.1	40.5	8	10	9.	5	9	7	29.145	29.142	29.144	29.139	29.130	29.135	46	32.8	.00136	816	3.799
	May,	49.6	40.8	45.2	48.7	49.6	49.1	16	2	9.	13	16	14.5	29.437	29.447	29.442	29.433	29.431	29.432	46	40.5	.00178	860	3.681
	June,	55.5	49.3	52.4	54.6	55.9	55.2	17	3	10.	15	17	16.5	29.279	29.274	29.276	29.279	29.271	29.275	46	48.4	.00228	878	4.627
	July,	58.7	51.7	55.2	57.7	59.4	58.5	19	4	11.5	17	21	19.	29.342	29.345	29.344	29.344	29.338	29.341	46	47.4	.00221	777	1.249
	August,	57.0	51.7	54.3	56.0	58.2	57.1	14	2	8.	13	12	12.5	29.229	29.234	29.232	29.230	29.230	29.230	46	51.5	.00251	911	2.191
	September,	54.2	47.9	51.0	52.6	54.8	53.7	10	2	6.	7	12	9.5	29.420	29.434	29.427	29.420	29.410	29.415	46	48.5	.00231	926	4.905
	October,	48.2	43.7	46.0	46.4	50.0	48.2	10	5	7.5	7	13	10.	29.335	29.325	29.330	29.343	29.281	29.312	46	42.5	.00189	893	1.049
	November,	33.1	37.8	33.0	37.4	38.9	38.2	6	3	4.5	4	6	5.	28.752	28.688	28.720	28.752	29.706	29.729	46	35.5	.00147	922	5.031
	December,	38.4	37.3	37.8	37.5	38.8	38.2	3	2	2.5	2	2	2.	29.405	29.416	29.410	29.400	29.409	29.404	46	36.0	.00153	943	1.425
	Means,	44.8	40.6	42.7	43.5	45.7	44.6	9	3	6.	7	10	8.	29.246	29.246	29.246	29.247	29.230	29.239	46	39.2	.00174	895	
Amount for the year,																		36.830						

For the Year.	Mean height of Thermometer.	Mean height of Barometer at 32° Fahr.	Mean point of Deposition.	Mean relative Humidity.	Quantity of Rain in inches.
1835	45.2	29.309	38.5	818	32.56
1836	43.9	29.238	40.0	883	37.21
1837	43.9	29.351	41.4	926	31.82
1838	42.7	29.246	39.2	895	36.83
Means.	43.9	29.286	39.8	880	34.6

Mean barometric height at the level
of the sea=29.82 inches, } its Log.=1.4745
Log. 29.286 =1.4667

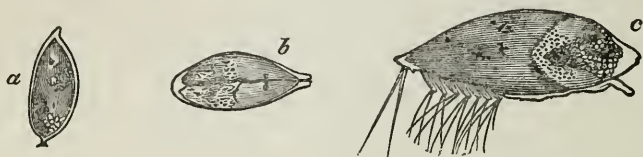
	.0078
	1000.0.
Height of the place of observation must be }	<hr/>
somewhere about }	78 fathoms, or 468 ft.

On the Metamorphosis of the Balanus punctatus of Montagu. By the
Rev. T. RIDDELL, Fellow of Trinity College, Cambridge.

Among all the facts recently brought to light in Animal History, there is, perhaps, none more wonderful than the discovery made by Mr Vaughan Thompson, and published in his Zoological Researches, respecting the transformation of the Balani. An account of Mr T.'s observations, together with a statement of the opinions of several eminent naturalists respecting the correctness of his views, may be found in the Penny Cyclopædia, Art. CIRRIPEDA. That an animal should be furnished, in the first stage of its existence, with organs of motion and swim about freely like a shrimp, and afterwards become immovably fixed to a rock and clothed with a hard stony shell, seems at first sight so highly improbable, that persons might be expected to suspend their belief till the fact should be fully proved.

Having heard from Dr Johnston in the beginning of June that he had found Balani in all their stages, near the mouth of the river at the fishing bat opposite Spittal, I went down the first favourable day to the place he had mentioned, and succeeded in obtaining several of the animals in the earliest stage of their growth, as described by Mr Thompson. They were spread in countless numbers over the stones, but none of them were free; all were found adhering, seemingly by a short fine pedicle or stalk, to some object, either stone, shell, or sea-

weed. In the course of the day (14th June) I sketched several figures with pen and ink; the annexed (Figs. *a* and *b*) are a side and back view. Under a high magnifier the skin which covers the globules (near the blunt end) has a granulated appearance.



On the following morning, when I examined the saucer containing the animals, I was surprised to see some of the *eggs* (as I had supposed them) moving swiftly about and swimming through the water. When I had taken one out and placed it in a hollow glass under the microscope, the rapidity of its movements was such as to prevent my examining it; shortly afterwards it was seen to move more leisurely along the bottom of the glass, putting forth a sort of tongue which it fixed on the glass in front of itself, and then retracted so as to draw itself forward. My first thought was, this is evidently an entomostracous animal, a cypris or something similar; but having a small creature of that kind (some species of *cythera* probably) under the microscope at the same time, there appeared a marked difference between them, the limbs of the latter being evidently much more perfect.

In the course of the day having obtained a loan of Mr Thompson's work, I was enabled to compare his figures with my own observations.

Respecting Fig. 1, Plate IX. which is intended to represent the natural size of the young animal, it must be observed that this is full twice as long as it ought to be, and more than twice as broad. This remark is not so unimportant as it may at first appear. The size of the young *Balanus*, as given by Mr T., has been alleged as a strong argument against the correctness of his views, because perfect animals are frequently found much smaller. Perhaps the enlargement of a minute figure in the process of copying and engraving is not uncommon.

Fig. 2 represents an indentation at the top of the case, corresponding to the cleft in the animal. This has not been observed either by Dr Johnston or myself.

The annexed figure (Fig. *c*.) answers to Mr T.'s 3d figure. The eye (Fig. 4.) I did not see; of the tail I have only seen the two long bristles, which are much longer than in Mr T.'s drawing. Fig. 6 I have not been able to verify, but I have no reason to judge it otherwise than correct.

As yet I have not been so fortunate as to ascertain the actual change of the above animal into a *Balanus*; but the circumstances of their being found together, and the great similarity between the *Balanus*

clothed with its first shell and the animal in question, tend very strongly to confirm Mr Thompson's observations. It seems to me highly probable that, previous to the decisive change, the animal turns half round in its case so as to be nearly at right angles to its former position.

The organ by which the young animal fixes itself is the fore-foot; this part, therefore, is liable to be injured in detaching it; and this may be the reason why I only saw one fore-leg, though Mr Thompson gives two in his figure.

May and June seem to be the months when the young Balani are most numerous. Those who wish to observe the singular transformation should be on the watch at that time; and it is certainly very desirable to obtain as many and as complete observations as possible on such an interesting subject of inquiry.

A Description of the CEPHALOPODA which inhabit the coast of Berwickshire. By Dr JOHNSTON.

CEPHALOPODA DIBRANCHIATA.

* Head surrounded with eight nearly equal arms.

1. OCTOPUS. Body enclosed in a sub-globular sac, rounded at the base, unfurnished with fins; arms connected at their origins by a broad membrane; suckers sessile, toothless.

** Head surrounded with eight arms and two long tentacula.

2. LOLIGO. Body enclosed in an elongated cylindraceous sac, pointed at the base, and winged below, separate behind from the neck; suckers pedunculate, the rim strengthened with a horny denticulated ring; dorsal plate thin and horny.
3. SEPIOLA. Body enclosed in a short sac, rounded at the base, furnished with rounded fins attached to the sides; dorsal plate horny, minute and very slender.
4. SEPIA. Body enclosed in an oval sac rounded at the base, furnished on each side throughout its whole length with a narrow fin, and strengthened dorsally with a calcareous lamellated cellular oval plate, lodged in a peculiar cavity; suckers irregularly scattered, with horny toothless margins.

1. OCTOPUS. LAMARCK.

1. *O. ventricosus*, scentless; body ovate, smooth or granular, profusely sprinkled with reddish-brown dots; arms straight, taper, longer

than the body, winged; suckers uniserial. *Grant* in *Edin. New Phil. Journal*, January 1827, p. 311. Oct. octopodia, *Flem. Brit. Anim.* 254. *Sepia* octopodia, *Penn. Brit. Zool.* iv. 116. tab. 30.

Hab. Berwick Bay, frequent.

Body ovate, rounded at the base, contracted below the eyes, smooth or rather minutely granulated on the back, which is slightly convex, clouded, closely sprinkled over with small reddish-brown dots; sides rounded, lighter coloured, dotted: belly flattened, bluish-white, also sprinkled with dots, which, however, are larger, more distant, and arranged in almost regular lines. The arms are fully one-half longer than the body, finely tapered, connected together at their origin by a membrane which runs up the exterior edge, giving it a winged appearance; the suckers are in a single row, large, saucer-shaped, with a central hole crenulated on the rim, and the rim plaited in a radiating manner; towards the base of the arm they are larger and not in contact, but they soon become approximate, and gradually lessening in size they become very minute at the tips; there are about 100 on each arm. Eyes rather small, of a beautiful orange colour, resembling those of the toad, often concealed by the skin being drawn over them; the eyelids white, silvery, profusely dotted like the skin. Length of the body, in the largest specimen we have seen, $6\frac{1}{2}$ inches; breadth 4 inches; length of the arms $12\frac{1}{2}$ inches.

Pennant confounded this species with the *Octopus vulgaris*, nor was it properly distinguished and characterized until *Dr Grant* gave an excellent history of it in the *Journal* quoted above. The specific name *octopodia*, even had it the claim of priority, cannot be retained, since it is synonymous with the generic one.

When at rest this octopod lies prone on his belly, the arms spread out in front with their extremities disposed in spirals on the sides. It has in this position considerable likeness to a toad, and often raising the back and head, its aspect is really repulsive and threatening. The changes of colour from reddish-brown to a dull greyish-white, and frequently clouded or spotted with different shades, are made with remarkable velocity, and without any obvious cause. The respiration is regular, and in one specimen of medium size, respiration was performed eleven times in a minute, at each time a strong current of water being propelled through the funnel, while water flowed in at all sides of the sac in every inspiration. Sometimes the creature would suddenly expel from its funnel a stream of water with unusual force, and lance it forth three or four feet. It moves quickly, and always retrograde, playing its arms in a regulated graceful manner which no one can contemplate without wonder in so grotesque a body and apparently so unapt for locomotion. When it swims, the arms are all drawn together and lanced straight out from the head in a column, the body being thus, by successive strokes, driven backwards. Though our specimen was subjected to much irritation it did not eject any of its inky fluid.

2. LOLIGO. LAMARCK.

1. *L. vulgaris*, the fins, together with the tail, forming a rhomboidal expansion; margin of the sac three-lobed; dorsal plate narrowed anteriorly, the edges thin. *Lam. Anim. s. Vert.* vii. 662. *Flem. Brit. Anim.* 252. *Sepia* Loligo, *Linn.* *Penn. Brit. Zool.* iv. 115. tab. 29.

Hab. Berwick Bay, not uncommon.

Body subcylindrical, gradually tapered to the tail (which is drawn in by the fins being continued round it), profusely sprinkled with small reddish-brown dots, which are not perceptible about the mouth, on the inner surface of the ten-

tacula, and on the under surface of the fins; eyes large, without lids; lips plaited; surrounding the mouth and attached to the base of the arms, there is a thin membrane with six angles, produced and armed in the central aspect with very small suckers; suckers of the arms biserial, of the tentacula quadriserial, and placed only on the enlarged tips; sac trilobate; dorsal plate large, like a pen, the shaft being towards the head. Length of the body sixteen inches, of the tentacula fourteen, of the arms about six, but they are unequal, and some of them do not exceed four, of the bone fourteen and a half inches. Makes an excellent bait for cod, but does not occur in sufficient numbers to be used by our fishermen. The ink is jet black. I have found the beaks of a small individual in the stomach of a large one, so that it certainly feeds occasionally on its own race.

2. *L. sagittata*, the fins, with the tail, forming a triangular expansion; margin of the sac even; dorsal plate narrow, three-ribbed, widest at the apex and lanceolate, the inferior end saccate. *Lam. Anim. s. Vert. vii. 663. Flem. Brit. Anim. 253. Sepia Loligo, Monro Ph. of Fishes, 62. tab 41 and 42.*

Hab. Berwick Bay.

This is commonly less than the preceding, and, from the shape and position of the fins, the outline of the body is considerably different. The sac is smooth, cylindraceous, tapered to a point below, the upper margin free, even or only obscurely pointed in the middle of the back. The dorsal plate is thin, narrow, strengthened with a rib down the centre and a stronger one along each margin, widest and lanceolate at the top, whence it gradually grows narrower until within an inch or so of the end, where the ribs seem to unite in one, and the plate is again dilated and formed into a pouch at the termination. The lip encircling the beaks is furnished with numerous suctorial papillæ; and the membrane at the base of the arms is more or less distinctly divided into eight angular pointed segments. Arms unequal in size, tapered, straight, with two rows of suckers; tentacula as long as the body, covered with suckers to within an inch and a half of their origins, but at first the suckers are very small, and become suddenly larger towards the extremities; all of them hang from a short peduncle that has a lateral insertion, and small suckers, on longer peduncles, are intermixed with the larger; these are cup-like, and have the margin armed with a horny denticulated ring. The ink is of a blackish-brown colour, or dark olive-green. The stomach of a large specimen I found filled with fragments of *Alaria esculenta*, on which the creature had been feeding when taken, for pieces of the same were found between the beaks half swallowed. It appears, therefore, that this species feeds occasionally at least on sea-weed.

3. SEPIOLA. LEACH.

1. *S. vulgaris*, suckers in two alternate rows; tentacula without suckers. *Grant in Trans. Zool. Soc. i. 77. tab. 11. fig. 3—13. Sepiote commune, Cuv. Reg. Anim. iii. 15. Loligo sepiola, Lam. Anim. s. Vert. vii. 664. Flem. Brit. Anim. 253. Sepia sepiola, Linn. Penn. Brit. Zool. iv. 117. tab. 31. fig. 2.*

Hab. Berwick Bay, very rare.

Body one inch long, smooth, irregularly and closely spotted with red and brown, and the spots appear and disappear at the animal's pleasure, assuming various forms; head large; eyes large, without lids; iris black, the conjunctiva white; suckers biserial; the arms unequal; tentacula as long as the body,

filiform, slightly dilated at the tips; fins small, rounded subdorsal, and reflected backwards; funnel white. Although kept alive, in a basin of sea water, for about twelve hours, and repeatedly irritated, it never ejected any inky fluid, with which it is nevertheless amply provided. I have taken a perfect specimen from the stomach of the Lythe.

4. SEPIA. LINNÆUS.

1. *S. officinalis*, "body smooth; feet as long as the body; dorsal plate elliptical." *Linn. Penn. Brit. Zool.* iv. 117. *Flem. Brit. Anim.* 252.

Hab. Berwick Bay?

The cuttle-fish itself I have never seen, but its dorsal plate is frequently cast on our shore, more particularly on Holy Island, and as it is little injured, even the thin membranous border being generally entire, it seems evident that it cannot have been brought from a distance by the tides, and is probably the remains of native individuals. (For a description of this singular production, reference may be made to Cuvier's admirable work "*Sur les Mollusques*," *Mem.* i. p. 47; to Dr Fleming's *Philosophy of Zoology*, vol. ii. p. 436; or to the *Magazine of Natural History*, vol. v. p. 612.)

On the Nests of the Fifteen-spined Stickleback, or Gasterosteus spinachia of Linnæus.

In an early volume of the *Edinburgh Philosophical Journal*, there is a slight notice of fishes' nests found on the coast of Berwickshire by Admiral Milne, but the species of fish by whom they are constructed is not mentioned. Mr Duncan of Eyemouth has ascertained that they belong to the Fifteen-spined Stickleback,—a fact confirmed by the Rev. Mr Turnbull, to whom the Club is indebted for specimens.

These nests are to be found in spring and summer on several parts of our coast, in rocky and weedy pools between tide-marks. They occur occasionally near Berwick, but seem to be more common near Eyemouth and Coldingham. They are about eight inches in length, and of an elliptical form or pear-shaped, formed by matting together the branches of some common Fucus, as for example, of the *Fucus nodosus*, with various confervæ, ulvæ, the smaller floridæ, and corallines. These are all tied together in one confused compact mass by means of a thread run through, and around, and amongst them in every conceivable direction. The thread is of great length, as fine as ordinary silk, tough, and somewhat elastic; whitish, and formed of some albuminous secretion. The eggs are laid in the middle of this nest in several irregular masses of about an inch in diameter, each consisting of many hundred ova, which are of the size of ordinary shot, and of a whitish or amber colour according to their degree of maturity. The farther advanced are marked with two round black spots, which are discovered by the microscope to be the eyes of the embryo, at this period disproportion-

tionally large and developed. Masses of eggs, in different stages of their evolution, are met with in the same nest. It is evident that the fish must first deposit its spawn amid the growing fucus, and afterwards gather its branches together around the eggs, weaving and incorporating at the same time all the rubbish that is lying or floating around the nucleus.

For the safety of its nest and spawn, the fish is apparently very anxious for a time. Some individuals were watched, by Mr Duncan and the Rev. Mr Turnbull, for some weeks, and it was observed that the same fish was always in attendance upon its own nest. During the time of hope and expectation, they become fearless, and will allow themselves to be taken up by the hand repeatedly. There can be no doubt that their object in remaining near the nest is to guard it against the attacks of such animals as might feel inclined to prey upon its contents.

NOTE.—Since the preceding notice was read to the Club, the 2d volume of Mr Swainson's *Natural History of Fishes*, &c. has been published: and I find that in it these nests are said to be constructed by the *Gobies*, on the authority of Olivi. The question is worth further inquiry; but on mentioning this statement of Olivi's to Mr Maclaurin of Coldingham, he assured me that he had seen and watched the stickleback in the act of making the nests we have just described.

G. J.

Note on Dr DOUGLAS's paper on the Cessation of the Flow of the River Teviot.

THE drying up of the northern rivers in 1748, is similarly accounted for in the *Gentleman's Magazine* for April, p. 152, by a correspondent at Carlisle. He says, "although the snows of February were heaped on the mountains, by strong winds, intensely cold, yet there was a ground thaw in the plains. This constant drift of snow on the mountains, and intense cold of the air, consolidated the flakes in their descent" (meaning, I suppose, as they floated down on the surface of the water), "and a long succession of these congealed every standing pool, or mill-dam in the channel, to the bottom. So that the intermediate channel became dry.

"The different courses of the freezing air, and the situation of the mountains, with respect to the several rivers, were the cause why this circumstance did not happen to all on the same day. And that several adjoining rivers did not freeze must be attributed to their running through a more level, and, therefore, a warmer country; and for the same reason some parts of the *Esk* might have little ice, as it is not all surrounded by mountains."

T. R.

Notice of a curious Aquatic Larva, found in a Water Jug at Twizell, 8th March, 1839. By P. J. SELBY, Esq. of Twizell-House.

IN length, it measures about three lines, and is of a peculiar shape, being anteriorly slender, and bulging posteriorly into an oval or flask-shape. The posterior extremity is furnished with a small central sucker, and three lateral fleshy protuberances, which also act as suckers, and by means of which it adheres to the glass or sides of any vessel in which it is placed; it also possesses two fleshy tubercles or pro-legs on the convex surface of the first segment; and its mode of progression is something similar to that of the geometrical caterpillars, as, when wanting to change its situation, it extends its body to its full length, and then fixes its anterior legs, after which it draws up the hinder part of its body to where they are placed, and securing itself by the suckers, thus advances by alternate movements, each step covering a space nearly the length of the whole body. The head is of a square form and large, and the eyes, which are black, are situated towards the margin of the hinder angle. On the forehead, two pellucid bristle-like antennæ are visible, and the mouth is furnished with a curious apparatus, the parts of which, however, are too small and delicate to be distinctly made out, without the aid of the microscope. Under a considerable power, these parts exhibit a beautiful and highly-curious conformation; but are admirably adapted to its mode of life and predacious habits in this its larva state. To convey an accurate idea of these cibarian instruments by verbal description, is almost impossible; for, to be properly understood, they ought to be seen in action, and under the power of a high magnifier. The following description, however, may serve to give some general notion of their structure and mode of action:—On each side of the superior part of the mouth, and below the insertion of the antennæ, an instrument (which I take to be one of the palpi), of extraordinary configuration, and which, when fully developed, and the animal is engaged in search of prey, projects to a distance on each side of the head or face: the basal part of this instrument is composed of a large and powerful clavate-shaped joint, the apex of a number of bristles, or rather fine laminae, which diverge or open like a fan; only, that being bent, they form, when thus expanded, a concave or hollow trap. These vibrissæ,—except in so far as the whole of the apparatus can be opened or shut, or placed in a state of rest over the mouth,—possess no vibratory motion, nor do they appear to be furnished with ciliæ; but to produce a current, and bring the animalculæ upon which the larva feeds within the vortex of this curious and delicate trap, two other members of the mouth, and which I consider to be the mandibles, are constantly engaged in alternately catching at a small projection, which is placed

upon the upper part of the large joint of the extended palpus. This catching, or sudden jerk, gives to the delicate hairs or laminæ a rapid motion, and creates a current, by which its prey is brought within the concavity they form. The mandibles above mentioned are stout, and furnished with a small hook at the end, which catches at each movement the projection upon the palpi above noticed. The moment an animalcule touches the internal surface of the vibrissæ, they close upon it, and it is forthwith conveyed to the mouth and devoured. When at rest, the fan-like portions of the palpi are folded, and brought into contact or alongside the basal joint, in which position they cover the upper part of the mouth. The body of the creature is pellucid and diaphanous; and the internal parts are plainly visible through the integuments. One of the most striking peculiarities of this animal is the mode in which the motion is communicated to the fan-like process of the palpi, in order to create a current; for in this instance, it is not effected by the movement of the hairs themselves, nor by the rapid motion of ciliæ attached to them, as is seen in various crustacea and other insects, but by the mechanical intervention of another oral instrument. The animal was kept for some time in a glass of water, but died before undergoing a metamorphosis.

Case of Andrew Mitchell, aged ten years, son of Robert Mitchell of North Charlton, in the parish of Ellingham, Northumberland, Shepherd, and Ann his Wife.

FROM about the 1st of March 1839, the patient complained of pains in the head, particularly on each side above the ears, and of what he termed "gumbles," which shifted to different parts of his head; and expressed his belief of something moving about in his head. These pains and *feels* continued and increased till between nine and ten of the night of the 14th June following, when, whilst patient was in bed, an insect, as hereafter described, was discharged from his left nostril. Some blood followed on the day after the discharge of the insect.

The pains and *feels* continued with some interruptions till between five and six P. M. of July 5. following, when, whilst patient was sitting in the cottage, a *second* insect, exactly similar to that above mentioned, was discharged from the same nostril. For the first fortnight after this second insect was discharged, the pains in the head, particularly on the sides of the face above the ears, were very severe and distracting.

A third discharge of a similar but somewhat smaller insect took place on Saturday the 10th of August, while the patient was playing with other children in an out-house, being exactly five weeks and a day from the discharge of the second. A slight discharge of a tough

mucus, sometimes tinged with blood, takes place occasionally from the opposite nostril from that from which the three insects have been discharged. All the insects proceeded from the same nostril.

August 24. 1839.—Great discharge of blood, followed by much pain at night.

September 2. 1839.—Painful at times, with lumpy discharge. The pain has been for the most part on the left side of the face until a mercurial plaster was put there, when it partially shifted to the right side. "Gumbles" are felt in the head when he runs or takes any sharp exercise.

He is supposed to find some relief from sweet-oil dropped into the ear, as he frequently desires this to be done.

On the sixth of September the boy was brought to Twizell by his mother, and their statements tallied in every respect with the written account produced, and furnished by the Rev. Mr Perigal of Ellingham. The boy still continues to feel unpleasant sensations in the *left side* of the head behind the temporal region, and he complained much this morning after taking some quick exercise, of the pains in the head and left ear, and of the "*gumbles*," or peculiar sensations already noticed, from which symptoms, it would appear, that some *larvæ* exist in the passages or ethmoid cells. The larvæ excluded, two of which I examined (and one is now produced), are evidently those of a coleopterous insect, and they approach very closely to the figure of that of *Blaps mortisaga* in Westwood's Insects. Cases are upon record of vast numbers of the larvæ of this beetle, as well as the pupa, and, in one or two instances, the imago, having been ejected from the stomach. (See Westwood, who mentions one case of an Irish woman, supposed to have originated from drinking daily water mixed with earth from the graves of two Roman Catholic priests.) No case, however, similar to the present, or where they have existed in the head or nasal passages, is mentioned. The query is, How did the eggs or larvæ get there? The boy appears to be in delicate health from the effects produced by these insects, as, previous to this attack, he was quite healthy and strong. He has never felt any uneasy sensation in the stomach, or any other part, the head alone having been affected.

P. J. S.

P. S. Wohlfahrt has written a paper with the title "*De vermibus per nares excretis.*" A scolopendra has been found in the frontal sinus, and in the nostrils. Kilgour gives a case of *larvæ* in the nose destroyed by infusion of tobacco; Heysham another of a larva in the antrum maxillare. Mr Clark supposes, without sufficient reason, that in these cases the larvæ were those of an *œstrus*. See Young's Med. Literature, p. 418; and Lin. Trans. iii, p. 323.

G. J.

*Notice of MYLIOBATIS AQUILA of Cuvier, or Eagle Ray of Yarrell,
by Dr JOHNSTON.*

"MR TRAVIS, surgeon at Scarborough," says Pennant, "had, in the summer of 1769, the tail of a ray brought to him by a fisherman of that town; he had taken it in the sea off the coast, but flung away the body." To what species this tail belonged has never been satisfactorily determined. Pennant himself believed it to belong to the species called by the Brazilians *Iaberete*, but the editor of the edition of his work published in 1812, referred it to the *Raia aquila* of Linnæus, which is said to be a native of the Mediterranean. Dr Turton omitted it in his catalogue of the British Fauna; and in the works of Dr Fleming, and of Messrs Jenyns and Yarrell, it stands among the doubtful or undetermined species, the two latter expressing a belief that the tail might be referred to the *Raia Giorna*, with as much probability as to *R. aquila*; and, consequently, Mr Yarrell has given a figure of both these species to enable future inquirers the more readily to determine the question, should an opportunity occur to any of his readers of doing so.

Aware of these particulars, it was, with no ordinary delight, that I received a perfect specimen of the *Raia aquila*, on Wednesday last (September 11), which had been found that morning on the shore of our bay near Spittal. It was quite fresh, and in fine preservation; and proves, as I think, that the conjecture of Mr Travis's fish being the *aquila* is perfectly correct. There is, at all events, now no doubt that this species is a native of our seas.

The following is a description of my specimen. Body rhomboidal, expanded laterally, flat, thickish, and raised in the middle, which gradually passes into the thin sides or fins, of a uniform dusky olive-green colour, smooth and even. Head depressed, with a square vertex, or we may compare it to the figure of a horse's hoof, having an oblong space in the centre that represents the hollow part of the hoof; the front suddenly lowered, round and entire. Eyes lateral, wide apart, roundish, dark grey, overhung by a bony ridge. Behind them there is a large elliptical hole leading to the gills. There is a series of punctures on each side of the head, becoming most distinct and visible on the occiput. Each fin forms a wide triangle with entire plain margins. Posterior fins square, and very small proportionably. Tail once and a half as long as the body, flagelliform, tapering to a point, quadrangular, smooth, furnished with a small fin within two inches of its root, and immediately under this fin the aculeus or string is protruded, which is upwards of three inches in length, linear-lanceolate, long, serrated on both sides, the serratures reflected. Ventral surface whitish, duskier at the sides, smooth. Teeth transverse, linear-oblong, with a small open piece between the ends of every pair on each side.

Extreme breadth 21 inches. From the snout to the insertion of the tail 13 inches. Length of the tail $21\frac{1}{2}$ inches.

Contributions to the Flora of Berwickshire.

By Mr JAMES HARDY.

1. *HIPPURIS VULGARIS*. In a moss on the farm of Redheugh, called Penmanshiel Moss.
2. *VERONICA SCUTELLATA*. Marshes on Penmanshiel Moor; Bowshiel Dean; by the side of the water Eye; above and below Blackburn Mill.
3. *VERONICA ANAGALLIS*. Marshes near Blackburn Mill.
4. *VERONICA OFFICINALIS*. A dwarf variety with flesh-coloured flowers; on dry rocks in Winden Dean. Under the shade of fir trees the flowers of the plant are almost white.
5. *UTRICULARIA MINOR*. In old peat pits in Penmanshiel Moss and Langstruther Bog, abundant.
6. *SCIRPUS SETACEUS*. Plashy spot in Akieside; on Ewieside; and on the farm of Penmanshiel.
7. *ELEOCHARIS PAUCIFLORA*. Langstruther and Braid Bogs, and Ewieside, abundant.
8. *ELEOCHARIS CÆSPITOSA*. One plant viviparous; Penmanshiel Moor.
9. *ISOLEPIS FLUITANS*. In deep pools in Penmanshiel Moss-Burn.
10. *AMMOPHILA ARUNDINACEA*. Sea-shore at the foot of the Pease Burn.
11. *MELICA NUTANS*. Grows along with *M. uniflora*; in two or three tufts near each other on a cliff overlooking the small rivulet that intersects the wooded dean of Blackburn-rigg.
12. *GLYCERIA MARITIMA*. Between the Cove shore and Dunglass burn; on the sea banks near Fastcastle; growing from the dung of sea fowl, by whom it has been introduced.
13. *FESTUCA OVINA*, var. *VIVIPARA*. A single panicle of a plant in this state, the other stalks having brought seeds to perfection, occurred in an upland field on the farm of Blackburn.
14. *FESTUCA ELATIOR*. Inland in the Pease and Tower Deans; in Winden Dean; Braid Bog; and by the side of the water Eye, above Butterdean Mill.
15. *BROMUS GIGANTEUS*. Pease and Cockburnspath Tower Deans; deans in Penmanshiel Wood; Red Clues Cleugh; Blackburn-rigg-dean, abundant. This plant appears to connect the genera *Festuca* and *Bromus*. The awn is inserted above the bifid point, as in *Festuca*, not below it, as some authors state. In the most common state of the plant, the number of florets in the spike varies from three to four, with one rudimentary floret. Very luxuriant specimens have eight perfect florets.

16. *BROMUS RACEMOSUS*. Fields at Penmanshiel, and near the Cove. The spikes frequently bear stiff, appressed bristles.
17. *TRITICUM CANINUM*. Cockburnspath Tower Dean. Joints, and the culm a little below them, hairy.
18. *TRITICUM JUNCEUM*. Shore at the foot of the Pease Burn; and between the Cove shore and Dunglass burn.
19. *SCABIOSA SUCCISA*. On the sea banks between Dowlaw and Redheugh (the rock being greywacke), this plant is remarkably luxuriant, the foliage of a light-green hue, and almost always glabrous; while the claw of the florets is more developed than in the usual state of the plants. On red sandstone rocks, in a similar situation, the plant is ordinarily luxuriant, the light-green colour of the leaves is retained, but the pubescence is resumed.
20. *GALIUM PALUSTRE* var. *B. WITHERINGII*. In bogs on Penmanshiel Moor, and in Bowshiel Dean, passing into the common state of the plant. I have met with only one specimen of *G. PALUSTRE* having the stems smooth.
21. *GALIUM ULIGINOSUM*. Bogs in Penmanshiel Moor; and on the Lammermuirs.
22. *PLANTAGO CORONOPUS*; a variety with the leaves and scapes very hispid, and almost hoary. On rocks between the Cove shore, and the Pease burn.
23. *POTAMOGETON COMPRESSUS*. Large pool in Penmanshiel Moss.
24. *SAGINA APETALA*. Foot of Dunglass Dean.
25. *LITHOSPERMUM MARITIMUM*. In considerable abundance among the shingle, on a low part of the shore between Dowlaw and Redheugh.
26. *CYNOGLOSSUM OFFICINALE*. Sea-banks at the mouth of Lumsden Dean.
27. *PRIMULA VULGARIS*. Variety with pink flowers. In the Pease Dean. Varieties at times occur having the flowers edged or blotched with pink.
28. *PRIMULA VERIS*. Only two plants met with in Penmanshiel Wood.
29. *SOLANUM DULCAMARA*. Side of the Peaseburn, in a haugh, at the foot of Penmanshiel Wood.
30. *VIOLA LUTEA*. Hill above Ecklaw.
31. *GENTIANA CAMPESTRIS*. Old pastures above Blackburn mill; in Edmondsdean: on Coldingham Moor, near Penmanshiel Moss, in a spot that has at some former period been cultivated.
32. *HELOSCIADIUM INUNDATUM*. In the burns on Penmanshiel Moor; in Bowshiel Dean; and by the side of the water Eye, above and below Blackburn Mill.
33. *VIBURNUM OPULUS*. Sisterpath Dean, below Penmanshiel onstead; Harelawside Wood; Blackburn-rigg-dean; and Winden Dean.

34. *PEPLIS PORTULA*. In a pool, and by the side of a ditch, in Langstruther Bog.
35. *JUNCUS CENOSUS*. In a marsh, within the sea-mark, between the Cove shore and Dunglass burn, growing along with *Glaux maritima*, &c.
36. *RUMEX CRISPUS*. When the plant is littoral, as along the sea-shores of the parish of Cockburnspath, and in the chinks of greywacke rocks near Redheugh, there is a large tubercle on each petal; while the plants growing on the sea-banks, and inland, have generally only one perfect tubercle.
37. *TRIENTALIS EUROPEA*. About ten years ago there was a station for this elegant plant on Penmanshiel Moor, but it has been ploughed up. About two years ago, I found a small patch of it on Coldingham Moor, between Oldcambus Moss, and the Drone Moss. This year I have found it in a very large patch, and scattered in another place, under fir-trees in Blackburn-rigg Wood. It also occurs on the boggy moor adjacent to the wood.
38. *EPILOBIUM ANGUSTIFOLIUM*. Exceedingly abundant on the sea-banks between Redheugh and Dowlaw.
39. *POLYGONUM LAPATHIFOLIUM*. Not uncommon near Penmanshiel, and Cockburnspath Tower.
40. *ADOXA MOSCHATELLINA*. In Sisterpath Dean, below Penmanshiel onstead: abundant by the side of the Pease burn, above and below the forester's house.
41. *PYROLA MEDIA*. Red Clues Cleugh; Blackburn-rigg-dean; Birchy-bank, and Kitchen Cleugh. Also on the moors near Dowlaw, but never in flower. This plant flowers in its greatest beauty under long heather.
42. *PYROLA MINOR*. In Blackburn-rigg Wood, perhaps introduced, this being a wood of recent date. It abounds under fir-trees, in the older parts of the wood, which have once been ploughed. In the newer parts where it is rarer, it prefers a similar situation; being never found where the shade has not yet extirpated the aboriginal plants (*CALLUNA VULGARIS*, *ERICA CINEREA*, &c.) In the newer parts of the wood the occurrence of *HIERACIUM SYLVATICUM* is diminished or increased in dependence on similar circumstances.
43. *CHRYSOSPLENIUM ALTERNIFOLIUM*. Sisterpath Dean; side of the Pease burn, above the forester's house; abundant in Blackburn-rigg-dean.
44. *DIANTHUS DELTOIDES*. Sea-bank near the foot of Dunglass Dean.
45. *ARENARIA VERNA*. Sea-bank between Dowlaw and Redheugh.
46. *SEDUM VILLOSUM*. Langstruther Bog; Greenside Hill; Pease Bridge Woods.
47. *LYCHNIS DIURNA*. A variety with a white flower occurs in Lums-

den Dean, and in Edmond's or Edmer's Dean. This state of the plant may have led to the confounding of *L. DIURNA* with *L. VESPERTINA*.

48. *CERASTIUM ATROVIRENS*. Plentifully on rocks near the sea-shore, between Redheugh and Fastcastle.
49. *CERASTIUM ARVENSE*. Field at Penmanshiel; and on the farm of Redheugh.
50. *SPERGULA SUBULATA*. Old road-sides on Penmanshiel Moor.
51. *PRUNUS PADUS*. Red Clues Cleugh, and Bowsheil Dean.
52. *PRUNUS CERASUS*. Pease dean, probably planted; in course of being introduced by birds into Blackburn-rigg Wood.
53. *ROSA SPINOSISSIMA*. A variety with rose-coloured or pink flowers, the flower-stalks hispid, and the leaflets obovato-retuse, grows among whins in Bowshiel Dean. [*Rosa Ciphiana* of Sir R. SIBBALD.]
54. *RUBUS SUBERECTUS*. Blackburn-rigg Dean, tolerably abundant; Birchybank, Penmanshiel Wood, and Akieside, sparingly.
55. *RUBUS CÆSIUS*. Sea-banks between Redheugh and Dowlaw, advancing among the shingle, even to high-water mark, and then of the same size as *R. SAXATILIS*.
56. *RUBUS SAXATILIS*. Plentiful in Blackburn-rigg Dean, on the north side; sparingly in a shady ravine in Bowshiel Dean.
57. *PAPAVER DUBIUM*. Apparently the commonest species in the corn-fields in the parish of Cockburnspath.
58. *THALICTRUM MAJUS*. In shady situations on the rocks between Redheugh and Dowlaw.
59. *TROLLIUS EUROPEUS*. Moor near Penmanshiel Moss; Howpark Dean; Blackburn-rigg-dean.
60. *STACHYS AMBIGUA*. Side of the Pease burn, near the foot of Glenfyn Dean.
61. *PRUNELLA VULGARIS*. A dwarf variety with white flowers, and the spikes of a green colour, occurs in barren marshy spots, in a field near Blackburn-rigg Wood. Varieties with pink flowers are not rare.
62. *SCUTELLARIA GALERICULATA*. Side of the Pease burn, in a haugh at the foot of Penmanshiel Wood.
63. *DIGITALIS PURPUREA*. With white flowers on Ewieside, in the Pease dean, and on Penmanshiel Moor.
64. *LEPIDIUM CAMPESTRE*. In Lumsden Dean.
65. *COCHLEARIA DANICA*. On the sea-banks between Dowlaw and Redheugh, tolerably abundant. Flowers purplish.
66. *CAMELINA SATIVA*. A single plant among corn at Penmanshiel.
67. *CARDAMINE SYLVATICA*. Kitchen Cleugh; Bowshiel Dean; and Blackburn-rigg Dean. Frequent.

68. *CARDAMINE AMARA*. Pease burn, above the forester's house; Blackburn-rigg-dean.
69. *ARABIS THALIANA*. Sea-banks near Redheugh.
70. *GERANIUM SANGUINEUM*. Sea-banks behind Burnmouth.
72. *GERANIUM COLUMBINUM*. In a field near Penmanshiel.
72. *OROBUS TUBEROSUS*, var. β *TENUIFOLIUS*. Penmanshiel Wood and Moor; in Blackburn-rigg Wood. On the sea-banks the leaflets of this plant are remarkably broad.
73. *VICIA SYLVATICA*. Red Clues Cleugh, very abundant on the northern exposure; deans in Penmanshiel Wood; abundant below the forester's house.
74. *VICIA LATHYROIDES*. Foot of Dunglass-dean.
75. *ASTRAGALUS GLYCYPHYLLUS*. On the sea-banks at the Ewelairs; between the foot of the Pease burn and the Cove shore.
76. *TRIFOLIUM ARVENSE*. Pease-dean; Siccar-Point; near the Cove shore; on greywacke rocks on the sea-banks below Dowlaw.
77. *HYPERICUM HUMIFUSUM*. Fields on the farms of Penmanshiel and Butterdean.
78. *SONCHUS OLERACEUS*. A peculiarly marked variety of this plant occurs in the vicinity of the sea along the coast of Berwickshire, It is characterized by having the flower-stalks very downy when young; involucre usually bearing a number of glands; leaves lyrato-pinnatifid, the terminal lobe angled and largest, generally destitute of spines; of a glaucous-green colour; in texture thin and flexible; achenia minutely wrinkled. In rocks near Redheugh, this variety is almost stemless, and the leaves spread around the root in the manner of a star. This plant is the var. β of Smith, Eng. Flor. and var. ν of Koch Flor. Germ. For the synonyms I am indebted to the kindness of Dr Johnston.
79. *LEONTODON TARAXACUM*, with the leaves hispid on both surfaces; on the sea banks near Dowlaw.
80. *HIERACIUM MOLLE*. Blackburn-rigg-dean, on the north bank, rare.
81. *CICHORIUM INTYBUS*. Fields at Penmanshiel.
82. *CARDUS NUTANS*. In a field near Blackburn-rigg Wood, abundant but local. The musky smell appears to reside most powerfully on the under surface of the leaves.
83. *CNICUS HETEROPHYLLUS*. In marshy spots on the top of the sea banks between Redheugh and Dowlaw. The leaves of this species emit a strong musky smell.
84. *SENECIO VISCOSUS*. Very abundant in Glen-Fyn-dean, on the southern exposure; rare and dwarf on the northern exposure; in the Pease dean, and at Redheugh shore.
85. *SENECIO JACOBÆA*. A variety without the ray, grows by the side of the Pease burn, above the forester's house.

An Address to the Berwickshire Naturalists' Club. By the Rev. THOMAS RIDDELL, President, Fellow of Trinity College, Cambridge, (*Read at the Anniversary Meeting held at Holy Island, September 29, 1840.*)

GENTLEMEN,

THE meetings of our Club have always been marked with so much that is delightful at the time, and agreeable in retrospect, that you will readily believe me when I express my regret that I am prevented by engagements at a distance from attending and addressing you in person, when resigning the office in which your kindness has placed me.

It may be remarked, in reference to the pleasure we have enjoyed in our periodical excursions, that we have very seldom found the weather so unfavourable as to prevent us from sallying forth and obtaining some reward for our exertions. As the days of meetings are fixed long beforehand, this strongly attests the great preponderance of favourable weather in our part of the island—a circumstance which persons are not generally inclined to admit till it be thus forced on their conviction. I proceed to the minutes of our transactions during the past year.

The Anniversary was held at Milfield (18th September), and was well attended. Present, Rev. T. Knight, President, Mr Selby, Mr Darling, Drs Johnston, Clarke, and F. Douglas, Rev. Messrs J. Baird, H. Parker, and T. Riddell; and Rev. H. S. Templeton, a visitor. For several days previous the weather had been very showery, and remarkably cold for the season. On Saturday and Sunday the 14th and 15th, a very great quantity of rain fell, accompanied by an easterly wind. On the 15th, all the rivers and streams in the country were swollen much beyond their usual bounds. In many places the banks were overflowed, and the water rushed with great impetuosity over the haugh lands, and did much damage by sweeping away entire fields of corn in some places, and in cutting up and otherwise destroying the pastures in others. The new bridge in progress of erection near Norham was carried away by the weight of the water and of corn pressing upon it, while the centering was still standing. This circumstance will serve to distinguish the flood in the memory of the neighbouring inhabitants for many years to come. The 18th was not very favourable for the pursuit of objects of natural history. The weather was showery, but at intervals the sun shone brightly. Few or no insects were on the wing; most of the wild flowers had ceased to blow; and nothing remarkable was observed among the feathered tribes, with the exception of a redstart seen at a farm-onstead at a short distance from Milfield village. The party directed their course

along the high road as far as Akeld Bridge, where they ascended a deep wooded ravine, abounding with mosses and fungi. In consequence of the wetness of the season, the latter were particularly abundant, and a few rare ones were picked up. The members then ascended the ridge of hills in the direction of Yevinger Bell, where an extensive and varied prospect presented itself to our view. The spire of the Town Hall of our good town of Berwick-upon-Tweed was descried in the distance, and further westward Dunse and Dirrington Laws bounded the landscape. The river Glen winded through the vale at our feet, and recalled to the mind the days of Edwin and Paulinus, when that zealous bishop spent thirty-six entire days from morning to evening, in instructing the Northumbrians, and baptizing converts in the river. The names of *Adgebrin*, *Melmin*, and *Gleni*, which are found in the pages of Bede, leave no doubt of the locality of this interesting portion of history; though both Yevinger and Milfield have long since ceased to be abodes of royalty.

On Yevinger Bell nothing was observed except a number of familiar faces, with which the members had become acquainted on a former visit. The remains of a circular entrenchment occupies the summit of the hill, and fortifications seem likewise to have existed on some of the neighbouring hills; but the position of this circle on sloping ground seems rather to mark a place of meeting, probably for worship or for sacrifices, than a British or Pictish encampment, as some have judged it to be.

The party, on descending the hill, were greeted with a very heavy shower of rain, which put an end to their excursion. We returned to Milfield to dinner, and after a comfortable repast, the Rev. T. Knight proceeded to read the Annual Address, which was listened to with interest, and warmly applauded. The Rev. T. Riddell was then appointed President for the current year. The communications made at this meeting, though few, were highly interesting.

Mr Selby read a curious account of a boy who had at various times discharged caterpillars (the larvæ of the *Blaps mortisaga*) from his nose. This paper has appeared in our Transactions, accompanied with a notice of similar cases by Dr Johnston. Since last year no additional caterpillars have been discharged, and the boy's health is improving.

Dr Johnston announced the capture of the Eagle Ray (*Myliobatis Aquila*) at Berwick, the first undoubted instance of the fish being caught on the British coast. A very excellent drawing of this fish was made by Mrs Johnston, and a figure taken from the specimen will appear in the forthcoming edition of Mr Yarrell's *British Fishes*.

The Winter Meeting was held as usual at Berwick (18th December), and the attendance was not numerous. Present, Rev. T. Riddell, Dr Johnston, Dr Clarke, Mr Selby, Rev. Mr Turnbull; and Mr Maclaurin,

a visitor, well known to the members by his valuable contributions to our Transactions.

After the ordinary business had been transacted, and the stations fixed for the ensuing year, several communications were read.

The Rev. J. Baird sent a notice that a specimen of the Bohemian waxwing had been taken at Yetholm in the beginning of December.

The Rev. R. Cowe (of Whitsome) presented the Club with a description of the various modes of taking white-fish, &c. on the coast of Berwickshire, for which the Secretary was directed to write him a letter of thanks in the name of the Club.

Mr Maclaurin gave in a list of bivalve shells taken at Coldingham, new to Berwickshire.* This communication, therefore, is supplementary to the Catalogue given at p. 77 of the Transactions.

Mr Selby read a paper descriptive of a hybrid between the black-cock and hen pheasant. The bird was a male, and exhibited in a very striking manner the peculiarities of both parents. A female, probably belonging to the same brood, was killed the year before, and is preserved in the Newcastle Museum.

Mr Riddell read a notice of the scenes enacted in the neighbourhood of Yevering when Christianity was first introduced into that part of the country, under Edwin, King of Northumbria; and another on the prices and consumption of fish in England previous to the Reformation. The materials were chiefly those furnished by the publications of the Surtees Society, especially the excellent index annexed by Mr Raine to the volume containing the yearly accounts of Finchale Priory. Many sorts of fish were then used as food which no one would now think of eating.

Dr Johnston laid before the Club the first part of a descriptive catalogue of the Berwickshire Gasteropodous Mollusca.

The first meeting of the present year, held at Cornhill on the 6th May, I was prevented from attending. The members present were, Mr Selby, Dr Johnston, Dr Clarke, Dr F. Douglas, Rev. Mr Cunningham, Rev. John Baird; Mr J. Langhorne, Dr Wilson, and Mr Melrose, attended as visitors.

After breakfast, the party proceeded to the old tower and village of Wark, where parts of that ancient border fortress are still standing. On leaving Wark, the members directed their walk for nearly a mile along the river side towards Carham, and met with a few good plants,

* *Terebratula psittacea*.—A dead specimen, got on the lines of the Coldingham fishermen.

Pectunculus pilosus.—Not uncommon; but only dead specimens have occurred.

Donax——?—Coldingham. This is probably a new species.

Cryptodon flexuosus.—Exceedingly rare.

Lucina radula.—Common.

as *Myosotis sylvatica*, and several of the willow tribe, which beautified the banks of the river with their rich inflorescence and fresh-coloured foliage. During the months of March and April, the season had been remarkably forward; little more than the hundredth part of an inch of rain had fallen during those months, and for several weeks the heat of the sun was fully equal to that in high summer weather. In consequence, vegetation had correspondingly advanced: many trees were in full foliage, the hawthorn had expanded its beautiful and fragrant blossoms, and the clear musical note of the thrush brought delight to the ear of the attentive natural observer. While on the subject of the earliness of the season, it may not be uninteresting to remark, that, while the cuckoo's plaintive note was not heard last year till the 10th of May, in the present year it was observed as early as the middle of April. After leaving the river, the members walked to Learmouth Bog, an extensive morass, containing a number of wild fowl, and a very considerable quantity of rare plants; but, at the present season of the year, vegetation had not there made much progress. A few shells (*Helix*, *Planorbis*, &c.) were collected, but none new to the district occurred; and no insects were obtained. In consequence of the prevalence of an easterly wind, accompanied with occasional showers, none of those beautifully delicate inhabitants of the upper regions were on the wing.

After the minutes of the last meeting had been read, Dr F. Douglas proposed Mr Collingwood of Glanton Pyke, and Mr Jonathan Melrose of Coldstream, and Dr Clarke proposed Mr John B. Langhorne, as members of the Club. These gentlemen were elected unanimously.

Mr Selby presented a list of insects taken by Mr Hardy in the neighbourhood of the Pease Bridge.

Dr Johnston announced the occurrence of the *Arvicola riparia* at Mayfield in Berwickshire; and of the Tusk in Berwick Bay.

Our June meeting (Wednesday, 17th) was at Head Chesters, in the parish of Cockburnspath. Present, Rev. T. Riddell, Rev. A. Baird, Dr Clarke, Mr Selby, Mr Melrose, Dr Johnston; and Mr Tancred, a visitor.

After breakfast, we proceeded southward in the direction of Dowlaw. A few beetles were found sheltering under stones, but a very strong westerly gale, which blew all day, attended with smart showers prevented almost every other insect from appearing.

From the farm at Dowlaw we walked down to the Dean, and entered it near a small rough plantation, just opposite to a tiny waterfall, which trickled down in front of a perpendicular rock. Leaving the higher part of the Dean unvisited, we scrambled downwards to the sea, through a very rude and desolate region, with more stones than plants in it. Here, however, we met with the Rose-root, *Rhodiola*

rosea, 'in great profusion and luxuriance,' as Dr Johnston had previously noticed.

Having descended to within a short distance of the place where the Dean opens to the sea-coast, we went up the bank on the north side, and soon came in view of the curiously-shaped rocks which form projecting headlands, one of which is known as 'the cobbler,' from the resemblance it bears to a shoemaker sitting at his work. Skirting along by the high ground, we arrived at the heights above Fast Castle, and went down to view that remarkable relic of ancient times. It was possessed in the days of James VI. by Logan of Restalrig, and is said to have been the place to which the Ruthvens, if successful, intended to have carried their sovereign; and is also memorable as the spot where Napier of Merchiston, the mathematician and theologian, expected to find hidden treasures: of this latter fact there can be no doubt, as the agreement between Logan and Napier respecting the division of the money is still extant.

After dinner, Mr Riddell read a short notice of the *Balanus* in its first stage, supplementary to a former paper. The additional observations made this year tend to confirm still more the correctness of Mr V. Thompson's statements. The two fore-legs, and the six pair of hind legs, were distinctly observable; and each of the bristles forming the tail appeared furnished at their base with a comb, which the creature used to clean its hind-feet. It was kept alive for a fortnight, from the 5th to the 17th June; but it died at last without proceeding to its change.

The next meeting was at Dunse (29th July). Present, Rev. T. Riddell, Dr Johnston, Dr F. Douglas, Dr Clarke, Rev. Mr Cunningham, Rev. A. Baird, Mr Selby, Mr Collingwood, Mr Embleton, Mr Melrose.

After partaking of Mr Cunningham's hospitality at the Manse, the members divided their forces, one party proceeding to try the "gentle art" in the Whiteadder, while the other perambulated the beautiful grounds surrounding Dunse Castle. In the lake a very rare and beautiful aquatic plant, *Villarsia Nymphæoides*, was observed to grow and blossom abundantly. This is the first instance of its occurrence within the limits of the Club.* It has probably been introduced, but now appears quite naturalized. The lake seemed to be abundantly stocked with tench.

After viewing the striking exterior of Dunse Castle, the party directed their steps towards Langton Lees Cleuch, in search of *Saxifraga hirculus*, but they were not so fortunate as to discover its habitat.

* Mr Henderson of Chirnside has since found it in a large pond or dam-head behind the farm onstead of Foulden New-mains.

After dinner, Mr Embleton exhibited a specimen of the Short Sun-fish, taken in Embleton Bay some years before, which he had examined when it was just caught : and another of *Larus minutus*, the little gull, shot on the same locality in March 1838, the plumage of which indicated that it had only attained its second year. Mr Embleton likewise exhibited a specimen of *Comatula rosacea*, taken in Embleton Bay,—an interesting discovery, which will probably lead to that of the *Pentacrinus Europæus*, now believed to be the same animal in its earliest condition.

Mr Selby read a paper by Mr W. Forster of Newton, on the habits of the mountain sparrow ; and gave notice that several specimens of the pied fly-catcher (*Muscicapa luctuosa*), had been killed in the neighbourhood of Twizell in May of the present year.

I ought not to omit noticing a continuation of Mr Henderson's paper on the popular rhymes of Berwickshire, in which I am confident that more than one of us must be interested. A variation, characteristic of the locality, occurs in the Roxburghshire version of one of these rhymes, which a friend of mine heard from a little girl. 'If you wish to know what the lark says', said she, 'you must lie down on your back in the fields and listen, and you will hear him say,

' Up in the lift we go,
Tehee, tehee, tehee, tehee!
All the sutors in Selkirk can't make a shoe to me.
Why so? Why so?
Because my heel is as long as my toe.'

The weather generally on our days of meeting, though far from unpleasant, was yet very unfavourable for the entomologist, and therefore I regret the less that it is not in my power to lay before you an account of the insects which were observed. The arrangements of the animals of the district in catalogues, which has been carried on for several years by the most scientific members of our Club, must be very conducive to a complete knowledge of the natural treasures it contains; and if, in a few years, when they have been completed, they were published as a fauna, with notices of the more remarkable localities, especially in the case of rare species, they would furnish at once an incentive and a guide to the researches of future labourers in the same field. The known flora of the district has received great accessions in consequence of Dr Johnston's excellent publication, and there are now materials accumulated for a more complete exhibition of the botanical riches of the neighbourhood. It is most desirable that every means should be employed likely to spread the knowledge and the love of Natural History.

The pleasure derived from such pursuits will not be questioned by any one who has ever engaged in them, however slightly. But the

benefit to be derived from them, does not terminate in the feelings of admiration and delight. They conduce to the growth of a healthy frame of mind; especially when the naturalist sees in himself merely the interpreter of Nature, and is content in sincerity and humility to follow out the evidence of facts. The polemical and personal disputes which have in turns disgraced theology, literature, and science, arise from the pursuit of selfish aims, and those who have been involved in them have seldom attained the highest grade. The most brilliant discoveries and the largest views have generally rewarded the modest and simple-minded. Science especially must be loved for its own sake, and communicated from a desire to make others sharers in the pleasures and benefits it confers.

But I ought to apologize for stating truths with which you must already be well acquainted. In this spirit of sincere, unadulterated love of knowledge, the Club was founded, and on these principles its proceedings have hitherto been conducted. While, therefore, I ask your indulgence for my own deficiencies in discharging the office of President, I cannot do better, as regards yourselves, than exhort you to persevere in your usual course of patient observation, praiseworthy exertion, and the friendly interchange of scientific information.

Additions to the Popular Rhymes of Berwickshire. By JAMES HARDY.

As one gentleman connected with the Berwickshire Naturalists' Club takes an interest in the popular sayings of Berwickshire, I subjoin a few that occur to me for his consideration. Although their literary merit may be no higher than Mother Shipton's Prophecies, and similar productions, yet they may cast a light on the manners of past ages, preserve the memory of obsolete superstition, and be the sole records of events of which "a peasant's plaint prolongs the dubious date."

"The oak, the ash, the elm tree,
The laird can hang for a' the three;
But fir and saugh are but a weed,
The laird may flyte, but make naething beed."

This rhyme is interesting, both as it may bear incidental evidence to what were the indigenous and most valuable trees of the country, and as it may be connected with history. It is well known that the greater part of the south of Scotland was at one time overgrown with forests, which, from various causes, became thinned and wasted, and in many cases wholly extirpated. In the reign of James the Second of Scotland, the Legislature made a vigorous effort to repair the damage. A law was passed in 1457, "Anent plantation of woodes and hedges, and sowing of broome," which ordains that the "tennentes

plant woodes and trees, and make hedges, and saw broome, after the faculties of their maillings, in place convenient therefor, under sik paine as law and unlaw of the barone or lord sall modifie." Whether in this act there be any "pains and penalties" annexed for injuring wood, I have no means of knowing; but in various subsequent acts of the Scottish Parliament, rigorous punishments were inflicted, "*toties quoties*," (against) any person (who) should "contravene" the law, and "cut, break, or pull up any tree, or peel the bark off any tree." They extended "the punishment for destroying green wood, even to death, for the third offence." Probably the rhyme may perpetuate some cruelties exercised by the strong hand of power upon the peasantry, while they yet groaned under a state of villanage. For the facts in this illustration I am indebted to a paper on the "Laws of Scotland for protecting woods, trees, and enclosures," given in the Farmer's Magazine for November 1815.

"You're oure near the Water E'e."

Often said by a mother to a peevish child; but whether it refers to the Water Eye *par excellence*, or to the water of the eye, "*non nobis tantum componere litem*."

"Loudon loots, Merse brutes, Lammermuir whaps."

This is the satirical effusion of some nameless Pasquin. The following extracts from Ray's Itineraries may be appropriate. "August the 17th [1661], we travelled from Berwick to Dunbar, a town noted for the fight between the English and Scots." On the journey, the author remarked that "the women generally to us seemed none of the handsomest. They are not very cleanly in their houses, and but sluttish in dressing their meat." "The Scots cannot endure to hear their country or countrymen spoken against. They have neither good bread, cheese, or drink; they cannot make them, nor will they learn. Their butter is very indifferent, and one would wonder how they could contrive to make it so bad." When he appears to have arrived in the vicinity of Dunbar, he says—"We observed little or no fallow grounds in Scotland; some layed ground we saw, which they manured with sea wreck. The people seem to be very lazy, at least the men, and may be frequently observed to plough in their cloaks." Why the Lammermuir people are designated whaps (curlews), I cannot determine. It probably relates metaphorically to their being still more uncivilized than their brethren in the low countries.

"The bat, the bee,
The butterflee,
The cuckoo and the swallow,
The kittiwake,
And the corn crake,
Sleep a' in a little hollie."

In these verses, I believe, we may trace the germs of an opinion, long prevalent even among the most eminent naturalists, against the migrations of certain animals. Those especially commemorated in the rhyme are termed the "seven sleepers." Ray gives a parallel triplet concerning the birds "which nestle in the Basse."

"The scout, the scart, the cattiwake,
The soland goose sits on the laik,
Yearly in the spring."

The magpie has in this country been always deemed a bird "of omen foul." The following is its portentous character:

"One is mirth, two is birth,
Three is a wedding, four is death,
Five is heaven, six is hell,
Seven is the devil's ain sell."*

This is a record of a dark age, and was averted by spitting four times on the ground. The following is more spirited, and in unison with better feelings. It is the song of the lark done into Scotch verse by some rustic rhymster.

"There is not a shoemaker on the earth,
Can make shoe to me, to me.
Why so? why so? why so?
Because my heel is longer than my muckle toe."

Note.—In Chambers' Picture of Scotland, there is a saying regarding Chooslie which I do not find in Mr Henderson's collection. It is "There's as good cheese in Choosly as ever chafts chewed, and the cheese of Cheshire is nae mair like the cheese of Choosly than chalk is like cheese." Chambers gives the illustration. J. H.

The White-Fishery on the Coast of Berwickshire. By the Rev.
ROBERT COWE of Whitsome.

1. *The mode of taking Herrings.*—Early in the season, before the nights are sufficiently dark for the fish to take the nets, a few herrings have been caught for several years by white hooks, at Burnmouth and Eyemouth. But the process is so tedious, and the number taken

* A parallel rhyme to this, is one that denounces the pretty yellow-hammer. I had it from a gentleman who passed his youth in the hills between Berwick and Roxburgh shires, where it may still linger. These three last rhymes are, I believe, not confined exclusively to Berwickshire.

"Yellow, yellow yorlin,
Drink a drap o' the deil's blude
Ilka Monday morning."

so very small, seldom exceeding a hundred or two in a night, that the fishermen are not likely to adopt this method very generally. The way of taking them is as follows: Several white hooks, without any bait, are attached to each side of a piece of whale-bone, or of any other material that will answer the purpose, and so secured that they project nearly at right angles to it; this, which is called a jigger, is let down as quickly as it will descend through the water, by the weight of the lead fastened to it; and after letting out several fathoms of line, it is jerked up and down, when the fish are taken. Sometimes the herrings take the hooks when the line is running out. The fishermen think that the fish mistake the white hooks for sand-eels.

But the usual mode of taking herrings is by nets. The nets are from fifty to sixty yards long when stretched out at full length; but when put upon the ropes to be ready for fishing, they are six yards shorter, as they require to be so arranged as to allow the meshes to open when suspended in the water. Each net is three hundred meshes in width, and has about thirty-two meshes to each yard in length. The average number of nets to a boat is eighteen. Each net is suspended by six buoys, which are composed in some cases of dog-skins, but usually of bladders, one when large, and two tied together when small. The tow or cords between the buoys and the rope of the nets are generally three fathoms long, which is found necessary to allow the ships to pass over the nets without getting entangled, and also to be a good average depth for successful fishing. When, however, the shoal comes so very near the shore that the nets would be torn by the rocks, if let down three fathoms below the surface of the water, and there being little danger from ships so near the land, two fathoms are used, and sometimes only one. The nets are securely fastened to each other by their respective ropes, when arranged in the boat, the buoys being put in at regular distances; and when the ground is reached where the crew mean to *shoot* or put out their nets, they throw the first buoy over the boat's stern into the water; and the boat that does this first is understood to be entitled to that berth for the night. The boat is then put right before the wind, way being kept on her sometimes by a part of the sail being allowed to stand, and sometimes by the use of two oars. The nets are put out in a straight line, unless when the nets of the next boat, in the hope of keeping among the fish, causes them to deviate from this course. The newest and best nets are kept next the boat, as being least exposed to danger in this situation; and the one immediately next the boat is fastened to it by a long and substantial ride rope, technically called the *swing*, which lets down this net to the level of the rest. After this is done, the mast is taken down to make the boat ride steadily. The boats and nets, thus secured to each other, drift with the tide during the whole night. In spring-tides, they are frequently

driven six miles in one direction. About an hour or so after the nets are *shot*, part of the net next the boat is pulled up and drawn in, to see whether any herrings are going in. Those found in it are taken out, and the net and swing let out again. By clearing this portion of the net, if more fish are found in it when they look again, they know off which place they have taken the net. When the fishing is not very abundant, if the nets keep clear, this is the only portion examined, which is done several times till the morning, when the whole are drawn in, in order to go on shore. The abundance of herrings sometimes renders it necessary to draw in the nets almost immediately after they are put into the water. They pull in their nets and change their berth when the nets take the ground, or, by the irregularity of the tide, are drawn together into a body, or when the nets of another boat drive upon them and become entangled. This last case occurs when the boats do not take wide enough berths from each other, or when one *fleet* of nets has less buoy-string, and is nearer the surface than those next them; for in this situation they drift faster, the tide being stronger near the surface than at a greater depth. The take for the night is not unfrequently lost in this way; for if the fish happen to rise towards the surface of the water, the prospect is marred for the night, an hour being sometimes sufficient for the purpose.

The herring not unusually rise to the surface, when they produce a motion something like a gentle shower of rain. Generally, they take the nets very gently, without deranging them in the least; but, when very abundant, they often rush into them with such violence that they raise them up and carry them over the ropes, twisting them round about two or three times; and when the bottom of the sea is very unequal, and the tide rapid, the nets often go down to the bottom at such a time, and considerable loss is sustained. The nets are often very unequally fished; and sometimes the herrings in one part of the nets are spawned, and those in the rest are not so.

The nets are stretched out half the length of the boat as they are drawn in, the herrings hanging by the head on the lower side, and most of them are shaken out, and fall into the bottom of the boat, as the work proceeds. When the fish are so plentiful as to render the boat too deep aft, if all taken into the stern, part of the nets are pulled in nearer the bow, to put her into proper trim. When the wind is violent and the sea high, the getting in of the nets is very hazardous, especially when they are well fished. The waves and wind, acting on the boat at the same time, overpower the strength of the crew, and sometimes compel them to let part of the nets already secured run out of their hands, to permit the boat to rise freely to the waves. The sea dashes into the boat with great fury, threatening to fill her; so that it is not uncommon, in such cases, for the fishermen to cut away their nets, and make with all possible speed for the

nearest harbour. The danger is increased in stormy weather, when the nets of two or more boats are entangled together. The plunging of the boats and the dashing of the waves render it very dangerous for the men to stoop over the boats to clear the nets; and the risk of collision prevents the boats from coming near each other to assist in clearing away the entangled parts. The nets are seldom got afterwards when thus cut away; or when found after the storm, they have been so much torn as to be almost useless. Nets are also frequently injured or lost by the buoys being maliciously cut off, when the nets go to the bottom and get fast to the rocks.

Instances have occurred, though not very lately, of boats deeply laden with herrings being, before reaching the shore, overtaken by wind, and going down. In one case, an accident of this kind near Holy Island was occasioned by the boat getting stern way through mismanagement, when she immediately filled and turned bottom up. Two of the men clung to the boat till they were rescued by another boat; other three who were in the boat perished. About twenty years ago, a Buckhaven boat went down about half-way between Berwick and Burnmouth from having too large a cargo. The night had been fine, but a brisk breeze sprung up in the morning, which was too much for the overburdened boat. A fisherman, from whom the writer had the account, was in a boat a little farther out at sea at the time, and he says, that the fears of himself and his companions were first awakened by seeing different articles, such as a hat and an oar, drifting past them. On sailing in the direction from which the floating materials came, the boat was found bottom up, but not one of the crew was to be seen. Weighed down by their heavy boots, and exhausted by previous fatigue, they had sunk to rise no more. But serious accidents sometimes happen at this fishing from mere stress of weather. Twelve years ago, a Greenses boat was upset in taking Berwick harbour during a heavy sea, occasioned by a violent north-east wind. Two men were drowned. The other two kept themselves afloat by the aid of the oars till they were rescued. A very affecting occurrence took place off North Sunderland six years ago, when the boats were fishing there. When about twelve miles from the land, they encountered a very high sea and violent wind, which compelled them to return. On their way back to the shore, one of the Eyemouth boats was struck by a heavy wave, and filled with water. The next boat tried to aid them: the steersman of it had a brother in the disabled boat, who was seen sitting on one of the thwarts immersed in the water, with his son, a boy, in his arms. The rest of the crew cried out to the skipper as they approached, "Will! mind your brother;" but in spite of all that he could do, the bow of the boat, tossed by the waves, pitched on the back of the unfortunate man, and then the one boat was driven over the top of the other. The blow, it was thought, broke his back, for

he made no effort to save himself after that. The assisting boat drove to leeward, and could give no farther aid. The next boat that came up, by throwing a rope, saved one man; the rest of the crew, to the number of four, perished.

Sometimes the nets are anchored in very shallow water, when the fish come so near the shore that they cannot be taken in the usual way. This is called *ground fishing*. They are anchored in the direction of the tide, to render the pressure as light as possible. As many as thirty barrels have been taken out of a single net in this way. The nets do not drive out among the fish by the tide as in the other way, so that by far the heaviest takes have been realized in this manner. But whether from the shoals being more assiduously sought out and broken in upon by our fishermen before the herrings reach the shore than formerly, or from some other cause, they do not come into small creeks among the rocks so frequently as in earlier years.

A much greater quantity of herrings is taken by each boat on this coast than formerly. This arises in part from the greater number of nets used by the fishermen, fully a third more than twenty years ago, and partly by greater diligence and activity in seeking out the fish, as well as by fishing on ground formerly thought so dangerous from the existence of shoals as to be carefully avoided. The portion of the bay between Berwick and Holy Island was one of these dreaded spots; whereas, for several years, the most abundant fishing has been realized there.

A much superior class of boats is now in use to those employed twenty or thirty years ago. They are much larger, carry nearly double the burden, and sail much faster. Some of them are thirty-seven feet long. The crew consists generally of four men and a boy, sometimes of five men. And what shews the improved circumstances of the fishermen, most of these boats are their own property, one shared in common sometimes by two and sometimes by three men; whereas, at an earlier period, it was common for them to hire the herring boats, and allow each boat a fifth or a sixth share of the money realized during the season.

2. *Mode of taking Haddocks.*—Haddocks are taken with hooks. The lines used for the purpose contain each from six to seven hundred hooks, which are arranged at the distance of a yard and a quarter equally along the whole line. The hooks are suspended from the *back* or principal part of the line by a *snood* and *wip* fastened together, the former a little thinner than the back, and made like it of hemp cord; the latter of hair, to which the hook is attached. When the materials are very strong and bulky the line does not fish well. The line, when baited, is carefully coiled into one end of a basket, about

three and a half feet long, and the hooks are laid in separate rows at the other end, which is of a flattish form for the purpose, with fog beneath them, and generally also between the rows. The bait used at Berwick is limpet and lug-worm. Mussels were once very much used, but they are not now to be had in sufficient numbers for the purpose. The limpets are taken out of the shell about two hours or so before being put upon the hooks, when they are put into clean milk-warm water to render them soft. If put on the hooks immediately after being taken out of the shell, the fish will not take them. They are also not very fond of them when they lie so long in the water before being put on as to swell too much and burst. When only three or four miles from the shore, the lug-worm is so much superior to the limpet, that double the quantity of fish is taken by it; but at a much greater distance out at sea, the difference is scarcely perceptible. The fish off there do not seem to be so nice as those which are near the land, and which pick up some of the crumbs that fall from the table of that cooking animal *man*. At Burnmouth and Eyemouth, from the scarcity of limpets, and having no lug-worm, they use a good deal of bullock's liver for bait, which is found to do very well. When the bait is old and stinking, very few fish are taken; and accordingly, the fishermen are in the habit of *baring* their lines, and putting on fresh bait, when the weather prevents them from getting out while the bait is in proper condition. In winter, the bait will keep on the lines a whole week, but in warm weather, a single day is enough to damage it.

When the fishing-ground is reached, a large stone is let down with a small rope fixed to it, to which the line is fastened, and a buoy floats above it, that they may know where to find it after the lines are all out. The basket is so put that the end which contains the hooks rests on the boat's gunwale, and the line is thrown out in regular order by the skipper, while the rest of the crew row the boat with the necessary speed, and in the right direction. Each man has a line, and when the first one is nearly out, the next is fastened to it, and cast out in like manner, and so on till the whole lines are out. A stone and buoy are put at the end of the last line, as with the first. The line next the boat to-day is second to-morrow, and so on in rotation, to make the risk equal. The lines, when shot by the oars, as is the case with cobs, are made to form the figure of an ellipse; so that nearly one-half of them are put out in opposite directions. When the last line is out, they immediately proceed to the first, being directed by the buoy, and forthwith pull them all up in succession, taking whatever fish happen to be on them; and then go on shore. The lines literally fish themselves. When the weather is hazy, and the buoy cannot be seen, they do not leave the last line at all, but tide their lines, as it is called, that is, they wait till the lines last shot have been so long in the water

as to have time to pick up the fish on the ground, and then the lines are drawn in the reverse order to what they were put out. In large herring-boats, such as those used at Eyemouth and Burnmouth at the haddock-fishing, as they are not manageable by oars like small cobs, the lines are shot in one direction with the sail, and are pulled in the same manner. The direction which they take is determined by the way in which the wind is blowing, that they may be able to sail both in shooting and hauling their lines. In such boats the lines are never shot right before the wind, for the reason assigned. When the wind shifts before they have secured them all, and blows violently, they frequently lose them, being unable to get them in.

The skipper or steersman is the person whose office it is to shoot and haul in the lines. It is a ticklish office for the fingers, as they come very frequently in contact with the hooks. It belongs to the man who sits next the skipper to take the fish off the hooks as they come into the boat. This is very dirty work, and requires considerable expertness when the fish are abundant.

Cod-fish are taken on the same lines, but when they are plentiful the fishermen put in stronger haddock-lines, as they easily break the hooks and wips of the finer lines. Codlings also are taken on the same lines, but they generally are found much nearer to the shore, and on hard rocky ground. Besides the kind of bait mentioned above used on these lines, herrings cut into pieces fit for the size of the hook are found very attractive for the fish ; but they are seldom to be had at the time of the cod and haddock-fishing.

Another class of lines is in use, of a much stronger description than the above, for taking cod-fish, ling, halibut, and skate. They are used in summer, in addition to those already described, and are called great lines. The hooks are large and strong, and set at a distance of four fathoms from each other. These lines are not brought on shore every day, but are baited in the boat, and remain out the whole season. The bait consists of haddocks cut in two, flounders, and other small fish.

A great many skate are generally got on these large lines during the first few days after they are set, till the ground is cleared, and then they become much less abundant ; a fact which shews that they are not of a *roving* disposition. And so prodigious is the power of these monsters, that, on the occurrence of a storm, which prevents the lines from being pulled in for a few days after they are first set, they frequently drag the lines to a considerable distance in their attempts to disentangle themselves. All the fish have a different tug or pull, so that the fisherman can distinguish at once if more than one is on the line between his hand and the bottom of the sea. The large fish are hooked when they reach the surface of the water, and drawn into

the boat by means of a *clippet* or large hook fastened to the end of a stick.

In prosecuting the herring-fishing, the fishermen are often directed by the appearance of whales, solan-geese, gulls, and the oily appearance of the water; but no such indication guides them in the haddock-fishing. They try here and there till they fall in with them. Sometimes they are very abundant immediately after the herring-fishing at those spots where the herring-spawn is deposited. The haddocks and cod eat it voraciously, and are sometimes got on every hook on such ground while the food lasts, when hardly one is to be got any where else.

The Berwick boats do not generally go so far out to sea at the haddock-fishing as the Eyemouth and Burnmouth boats, their market being so early that they would be too late for supplying it with fresh fish were they to go very far off. They employ, accordingly, a lighter and much smaller class of boats than the others, such as they can row with considerable rapidity in calm weather. The crew consists generally of four men, never more than five. They are a very unsafe class of boats in stormy weather.

The boats in use at the other places just named, are the same as those employed at the herring-fishing, and manned by six men. Though they seldom return earlier than three o'clock in the afternoon, it is a matter of little moment to the sale of their fish, as most of them are smoked and sent to the London, Edinburgh, and Glasgow markets. These boats are frequently taken with very heavy storms at the distance of twelve or fifteen miles from the land, and are seen plying to the shore with a head-wind when decked vessels are drifting to leeward. One of them beat the Mermaid Cutter under a reefed trysail a few years ago. The quantity of water thrown into them at such times is very great, which the men for safety are constantly employed in throwing out. Sometimes the yard breaks, sometimes the mast snaps like a carrot by the violence of the wind, in which cases, the boat must roll and drift at the mercy of the elements, till a spare one is put in the place of the broken one. Serious accidents occasionally occur in the hazardous employment. About five years ago, a Coldingham boat in a dreadful westerly wind went down under sail, when all hands perished. Many of the other boats despaired of reaching the shore that day, but they all got in safely with the above exception, though not without torn sails and broken masts. They get the haddocks in great numbers, in spring, on banks or shoals about fifteen miles from the shore; and the fish taken there are always larger than those caught nearer the land. A thousand is a good take; sometimes two thousand are taken at once; but this seldom happens.

Three persons are employed at Berwick for every line in use, unless when the bait is hired out, and one person undertakes two or more

lines; in this case, ninepence is paid for each line every day it is fresh baited. There is first the fisherman, secondly, a boy or girl to gather the bait and put it on the line, and, thirdly, a woman to go to market and sell the fish. Sometimes the whole earnings go to defray the expense of bait. The limpets have become very scarce of late, from the Eyemouth bait-gatherers coming to the rocks in the neighbourhood of Berwick, and even sometimes to the rocks south of Spittal, and filling their creels with the limpets upon them. The difficulty of procuring necessary bait is from this cause increasing every year.

It may here be noticed, that both the herring and haddock fishings sometimes suffer very considerably from the ravages of dog-fish. These pirates are seldom abundant when the herrings are in a compact body; but not unfrequently they occasion great destruction when a shoal is first drawing in near the land. The havoc they make is such, that they have been found to consume a dozen of barrels out of one boat's nets in the course of an hour. They also are very destructive to the nets when they get entangled. By their efforts to get free, their hard fins tear the nets: there is reason to think that they also use their teeth for this purpose. In like manner they make sad work among the haddocks. Occasionally half of those that take the hook have only the head left when they reach the boat. Sometimes the tail is stumped awry; sometimes a bite is taken out of the belly, and at other times out of the back. A cod-fish sometimes comes up a mere skeleton, stripped to the bone on both sides. They have their tastes, too, like other creatures. A haddock is preferred by them before a codling.

3. *Turbot*.—Turbot is taken with nets. The nets are 150 yards long, are corked along the ropes, have very large meshes, and are set on sandy ground, such as the fish is known to frequent. They are allowed to stand two or three days before being drawn up and taken on shore. The nets are let down to the bottom, as the turbot, like all flat fish, swims low, having an anchor or large stone at each end, with a buoy floating above. The turbot is rolled in the net when taken. This fish is not abundant about Berwick, but more would be taken if the price continued good, when brought regularly to market. The fishermen naturally employ themselves in the way that pays them best.

4. *Lobsters and Crabs*.—Lobsters and crabs are taken in two ways. The most common method is to employ a sort of case covered with net, with a heavy stone in the middle to keep it steady on the ground, and two round holes at each end. They are generally about three feet long, and a foot and a half high. These are let down to the bottom, pretty near the shore, with a string attached to each of them, which is

floated by a cork. The bait is put in the middle of the inside, and the fish enter by the holes at the ends. These *creeves* or cases are drawn up once a-day, the fish taken out, and fresh bait put in, when they are let down again for another take. The fishermen sometimes lose the whole when a storm comes away during the night, or so suddenly that they have not had time to get them ashore. They are placed so near the land that a high sea almost invariably breaks and scatters them, when they happen to be in the water at the time.

Lobsters seldom enter a case in which crabs are. The black coats do not seem fond of the company of red coats. Perhaps the crabs eat all up and give them no tithe. They also prefer different food. The crab likes a showy mess, such as skate-heads and tails, cod-heads and guts, and gills; but the lobster seems to know that it is not all gold that glitters; he has a predilection for flounders and haddocks, and other dainties.

Another way of taking lobsters and crabs is called trunking. A smaller case than the one described, and with a hole at the top, is used more especially for lobsters; or an iron hoop, with a net fastened to the rim of it, falling down like a land net, and leaving the upper part open. The bait is fastened in the middle, and after being a half an hour or so in water, they are quickly drawn up, the fish taken out, and then let down again. This method is used at night only.

The crab and lobster fishing has been much more attended to since the London market was opened to this part of the coast by steam communication between London and Berwick. But the lobsters will soon be harried if the fishermen continue to take them when full of eggs, as they have been doing for three years past. They should cease fishing at a certain season, as the Holy Island fishermen do.

List of Coleopterous Insects collected in the neighbourhood of the Pease Bridge. By Mr JAMES HARDY.

COLEOPTERA.

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|-------------------------------------|-------------------------------------|
| No. 1. <i>Clivina fossor</i> . | No. 10. <i>Pœcilus cupreus</i> . |
| 2. ... <i>collaris</i> . | 11. <i>Amara similata</i> ? |
| 3. <i>Cychrus rostratus</i> . | 12. <i>Harpalus æneus</i> . |
| 4. <i>Carabus arvensis</i> . | 13. <i>Agonum parumpunctatum</i> . |
| 5. <i>Helobia brevicollis</i> . | 14. <i>Trechus dorsalis</i> . |
| 6. <i>Steropus madidus</i> . | 15. <i>Anchomenus prasinus</i> . |
| 7. <i>Calathus melanocephalus</i> . | 16. <i>Notiophilus biguttatus</i> . |
| 8. <i>Omasseus melanarius</i> . | 17. ... <i>aquaticus</i> . |
| 9. <i>Amara trivialis</i> . | 18. <i>Elaphrus cupreus</i> . |

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|---|---|
| No. 19. <i>Colymbetes bipustulatus</i> . | No. 55. <i>Hypera polygoni</i> . |
| 20. ... <i>fuliginosus</i> . | 56. <i>Notaris acridulus</i> . |
| 21. <i>Gyrinus natator</i> . | 57. ... <i>bimaculatus</i> . |
| 22. <i>Necrophorus humator</i> . | 58. <i>Merionus obscurus</i> . |
| 23. <i>Necrophorus vespillo</i> . | 59. <i>Otiorhynchus notatus</i> . |
| 24. <i>Byturus tomentosus</i> . | 60. ... <i>ater</i> . |
| 25. <i>Ips ferruginea</i> . | 61. <i>Strophosomus coryli</i> . |
| 26. <i>Necrodes littoralis</i> . | 62. <i>Sitona canina</i> . |
| 27. <i>Oiceoptoma rugosa</i> . | 63. <i>Polydrusus undatus</i> . |
| 28. <i>Silpha atrata</i> ? | 64. <i>Phyllobius cæsius</i> . |
| 29. <i>Byrrhus pilula</i> . | 65. ... <i>argentatus</i> . |
| 30. <i>Byrrhus fasciatus</i> . | 66. <i>Apion hæmatodes</i> . |
| 31. <i>Dermestes lardarius</i> . | 67. <i>Deporaus betulæ</i> . |
| 32. <i>Helophorus aquaticus</i> . | 68. <i>Attelabus curculionoides</i> . |
| 33. <i>Aphodius fimetarius</i> . | 69. <i>Apoderus Avellanæ</i> (<i>rare</i>). |
| 34. ... <i>terrestris</i> . | 70. <i>Luperus flavipes</i> . |
| 35. ... <i>rufipes</i> . | 71. <i>Donacia sagittariæ</i> . |
| 36. ... <i>luridus</i> . | 72. ... <i>proteus</i> . |
| 37. ... <i>merdarius</i> . | 73. <i>Crioceris cyanella</i> . |
| 38. .. <i>inquinatus</i> . | 74. <i>Haltica nemorum</i> . |
| 39. ... <i>nigripes</i> . | 75. <i>Phædon tumidula</i> . |
| 40. <i>Ptinus germanus</i> . | 76. ... <i>Vitellinæ</i> . |
| 41. <i>Anobium striatum</i> . | 77. ... <i>marginella</i> . |
| 42. <i>Hylurgus angustatus</i> . | 78. ... <i>polygoni</i> . |
| 43. <i>Elater balteatus</i> (<i>new to Berwickshire</i>). | 79. ... <i>fastuosa</i> . |
| 44. <i>Cataphagus obscurus</i> . | 80. <i>Chrysomela staphylæa</i> . |
| 45. <i>Hypnoidus riparius</i> . | 81. <i>Coccinella variabilis</i> . |
| 46. <i>Ctenicerus cupreus</i> . | 82. <i>Endomychus coccineus</i> . |
| 47. <i>Aplotarsus rufipes</i> . | 83. <i>Tachinus apicalis</i> . |
| 48. <i>Rhagium inquisitor</i> . | 84. <i>Creophilus maxillosus</i> . |
| 49. ... <i>bifasciatum</i> . | 85. <i>Staphylinus ænecephalus</i> . |
| 50. <i>Pogonocerus nebulosus</i> (<i>rare</i>). | 86. ... <i>pubescens</i> (<i>rare</i>). |
| 51. <i>Necrobia quadra</i> . | 87. <i>Goërius fuscatus</i> ? |
| 52. <i>Ceutorhynchus quercus</i> . | 88. <i>Philonthus lamiatus</i> . |
| 53. <i>Nedys geranii</i> . | 89. <i>Othius fulgidus</i> . |
| 54. <i>Hypera punctata</i> . | 90. <i>Gyrophypnus rufipennis</i> . |

P.J.S.

The Mountain Sparrow. By Mr WILLIAM FORSTER.

IN the year 1834, I first discovered the Tree Sparrow at Tuggal Hall, being then in company with my friend Mr J. Hancock of Newcastle. Since then I have been almost a constant observer of the habits of this lively little bird. Tuggal Hall and the village of Tuggal were the two places where it generally inhabited; but since the proprietor of Tuggal Hall has cut down most of the plantation around it, there is now only a solitary bird to be seen occasionally. In the year 1836, I discovered a nest very neatly made in a hole of an ash tree;

it was composed of nearly the same materials as that of the common sparrow, but proportionably smaller, as were also the eggs and the spots upon them. The eggs were four in number. During the period of hatching, the male kept constantly attending upon the female, chirping, hopping about, and making a variety of motions nearly the whole of the day.

The tree sparrows commonly associate with the common sparrow, and may be easily detected from that bird by their mode of flying, their flight being invariably lower than that of the other, and accompanied by a shrill note. It also differs from the house sparrow in preferring always the thicket to the open branch or top of the bush on being approached.

NEWTON BY THE SEA, July 26, 1840.

Notice of a curious Hybrid, killed at Chevington Wood, Northumberland.

By J. P. SELBY, Esq. of Twizell-house.

HYBRIDS, in a wild or natural state, are so rarely met with, that every well authenticated instance of such an anomaly ought to be recorded, not only as a more curiosity or *lusus-naturæ*, but as tending to elucidate the laws of reproduction, and shewing to what extent, under certain circumstances, prolific intercourse is permitted between beings belonging to different species, genera, or groups of even greater extent. It is only under adventitious and peculiar circumstances that we can expect to find such anomalies in a natural state, as when a male or female of any species is left alone, and unable to find a mate. In such a case, the individual is inclined or driven to court the society of some nearly allied species that may chance to haunt the same neighbourhood, and intercourse, in consequence, sometimes takes place. Such, we conceive, to be the case in those well authenticated instances where the *grey-backed crow* (*Corvus cornix*), has been known to pair and breed with the common *carrion crow* (*Corvus corone*). In a confined or domesticated state, hybridism is more easily effected as the subjects of experiment can be kept together, and separated from all intercourse with other individuals of their respective species, and thus, as it were, compelling an intercourse. In such experiments, however, it has always been deemed necessary, in order to insure success, that the intended parents should be nearly allied, both generically and specifically, as in the case of the wolf and dog, horse and ass or zebra, among quadrupeds; the pheasant and domestic fowl, the Muscovy and common duck, the canary and other nearly allied finches, among birds. In the present instance, however, which is that of a hybrid between the black-cock (*Tetrao tetrix*, *Auct.*) and pheasant (*Phasianus colchicus*),

this near affinity is wanting: in fact, according to the views of the first ornithologists of the day, the respective parents belong not only to different genera, but to distinct groups of greater value or extent, the one belonging to the family *Pavonidae*, Swainson, the other to the *Tetraonidae* of the same author; and we may farther remark, that the habits of the two differ considerably from each other. This interesting and remarkable hybrid was shot on the 2d of December, by Lord Howick, at Chevington Wood, a large cover belonging to Earl Grey, two or three miles to the east of Felton. It proved a male, and partakes of the characters of both parents in nearly an equal degree. Its length, measuring from the tip of the bill to the end of the tail, is two feet one and a-half inch in breadth; with wings extended, two feet six and a-half inches. The tail, which is considerably rounded, is upwards of eight inches in length. The bill is intermediate in size and form between that of the black-cock and the pheasant. The upper mandible blackish-horn colour, the under paler. It possesses the naked papillous skin of the pheasant around the eye, but not to so great an extent; and the superciliary comb of the black-cock is fully developed. The tarsi are about two and three-quarter inches in length, feathered anteriorly like the black-cock for more than half their length. The feet partake of the character of both parents. The whole of the head and neck is of a deep purplish-black, with a rich metallic gloss. The breast and lower parts black, with several of the feathers upon the breast and sides shewing, upon being turned up, the arched cross-bar of the cock pheasant; thighs and legs yellowish-white, barred with black. The mantle or upper back is of a purplish-brown, the feathers partaking of the markings of the pheasant; the wing-coverts the same. The lower back is of a rich purplish-black. The tail, which is rounded, has the basal part of the feathers marked like those of the pheasant; their tips, with the exception of the two middle feathers, black for nearly two inches. It has no projecting spur like the pheasant, but a scale considerably larger than the rest on each leg, indicates the place where they project in that bird. Chevington Wood is within a short distance of Acklington Park, where the female hybrid of the same cross, presented to the Natural History Society, Newcastle, by the Duke of Northumberland, was killed about sixteen months ago. In all probability these two birds belonged to the same hatching. Upon dissection, the lobes covering the nostrils were observed to be not more than half the size of those of the pheasant; the processes at the root of the tongue larger than those of the pheasant. The general form of the body thicker than that of the pheasant; the exterior pectoral muscles much darker in colour than in the pheasant. Length of the crest or keel of breast-bone in the hybrid four inches and three-fourths; that of a middle-sized cock pheasant nearly four inches. Gizzard large; proventriculus thick and

slightly corrugated; gizzard filled with pebbles, the shells of nuts, and several seeds of the haw or holly berry. Testes about the size of a small pea, greyish and reniform; cœcal appendages two, originating about four inches up the cloaca, sixteen inches in length, and filled with excrementitious matter.

Notice of the Little Gull, Larus (Xema) minutus. By ROBERT EMBLETON,
Surgeon, Embleton.

OF all the gulls which frequent the British shores, the present species is by far the smallest, as well as the rarest: nor is it much more common in the western part of the European continent, its native habitat being more especially the eastern portions of Russia, Livonia, Hungary, and the shores of the Black and Caspian Seas; and although it has been considered as identical with a species common to America, we have the best reasons for affirming it to be entirely distinct. It was first noticed as occurring in our island by Colonel Montagu, since which period examples have been killed at different times; and we have ourselves had the pleasure of receiving it in a recent state.

Like the other species of the present genus, the Little Gull is a bird which exhibits a remarkable disparity of colouring in the winter and summer states of plumage, as well as from youth to maturity. All the examples killed in our island have been either in their immature or winter plumage. In summer it is characterized by a black head, which colouring it loses before the approach of winter; but in all the winter-killed specimens we have had an opportunity of examining, traces of this summer-plumage remained; and in this state an adult is figured in "Selby's Illustrations," which is represented by the foremost bird in the plate. Its flight is as light and buoyant as can well be imagined, and its general actions and form resemble those of the rest of the genus.

The colouring of the adults in their winter-plumage is as follows: The whole of the upper surface is of a beautiful bluish-ash; the quills and secondaries tipped with white; the throat and under surface pure white, with a slight tinge of rose colour; bill brownish-red; tarsi bright red; irides brown. In summer the whole of the head and upper part of the neck become of a brownish-black. The young, when a year old, resemble the adult in the winter-plumage, with this exception, that the shoulders, scapulars, quill-feathers, and tip of the tail, are deep brownish-black, and that the beak and legs are not so red. My specimen proved on dissection to be a male, a young bird, and was shot on the beach at Embleton during the severe weather in the beginning of the present year, 1838.

*A Descriptive Catalogue of the GASTEROPODOUS MOLLUSCA of
Berwickshire.* By GEORGE JOHNSTON, M.D., F.R.C.S.E.

PART I.

CLASS—MOLLUSCA GASTEROPODA.

ORDER.—PECTINIBRANCHIATA.

DIVISION—SIPHONOSTOMATA.

Animal trachelipode, shelled; the *shell* spiral or convolute, with the margin of the aperture channelled or emarginate at the base. The genera are all zoophagous, dioecious, and inhabitants of the sea.

SYNOPSIS OF THE GENERA.

* *Shell turbinate, operculate.*

Outer lip much expanded,	CHENOPUS.
Outer lip normal, the rim not ribbed.	
Siphonal canal elongated,	FUSUS.
Siphonal canal very short.	
Pillar rounded,	BUCCINUM.
Pillar flat,	PURPURA.
Outer lip with a thick rib or varix,	NASSA.

** *Shell convolute, non-operculate.*

Aperture linear with toothed lips,	CYPRÆA.
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1. CHENOPUS. † PHILIPPI.

Shell turreted; aperture oblong, a shallow canal leading from each extremity along a produced process or beak; lip greatly dilated, entire or digitate, with a sinus contiguous to the canals; operculum horny.

1. *Ch. pes pelecani*, shell pale brownish flesh-colour, finely striated spirally; the spire tapered, of 10 whorls, raised and nodulous round the middle; the body with three nodulous bands, the two inferior approximate and small; aperture white: lip dilated, sinuated above and below, and furrowed with 4 channels, of which one is up the spire; canal short, bent. Length $1\frac{2}{3}$ ths; breadth 1 inch. *Philip. Moll. Scil.* 214. *Rostellaria pes pelicani, Lam. Anim. s. Vert.* vii. 193. *Flem. Brit. Anim.* 359. *Strombus pes pelicani, Linn. Dillw. Rec. Sh.* 656.

† It seems to be now agreed that the shell which forms the type of this genus ought to be separated from the *Rostellaria* of Lamarck. Mr Swainson gives the new genus the name of *Aphorrais*, borrowed from Da Costa (*Malacology*, p. 309); but Da Costa's genus was ill defined, and was rather coequal with *Pteroceras* of Lamarck than with *Chenopus* of Philippi. See his *Elem. of Conchology*, p. 230.

Hab. Berwick Bay, in deep water, frequent.

Animal with two long cylindrical slightly tapered tentacula of a scarlet colour spotted with pale yellow, yellowish on the under side: eyes at the base, external, prominent, sessile: mouth at the end of a long cylindrical snout, scarlet, speckled with pale yellow; the tongue slender, cartilaginous, jointed, invested in a sheath: body whitish, freckled with scarlet: margin of the cloak plain, reflected, with a very short canal in place of a syphon: penis placed under the opposite tentaculum, retroflected, curved, flattened: rectum opening above the penis with a narrow orifice: foot somewhat pedunculate, oblong, truncate anteriorly, tapered behind, rather short, plain, white: operculum fixed on the back of the foot, horny, elliptical, and rather small. Creeps very slowly, the tentacula being widely extended, and used as feelers. The faces are in the form of small egg-shaped pellets, and are deposited in heaps. The interior of the shell is purplish.

2. FUSUS. LAMARCK.

Shell fusiform, ventricose at the middle, the spire produced; aperture oval, with an elongated straight canal; pillar smooth; outer lip even, acute.

1. *F. antiquus*, shell ovate-fusiform, white, thick, plain, obsoletely striated in a spiral direction; whorls nine, rounded and angulated in the middle; aperture oval, dilated, yellow with a white rim; pillar with a thick fold at the base; canal short. Length about 6 inches. *Lam. Anim. s. Vert. vii. 125.* *Flem. Brit. Anim. 348.* *Murex antiquus, Linn. Dillw. Rec. Sh. 724.*

Hab. Berwick Bay, in deep water, frequent.

I have a specimen of this shell, found near Alemouth, and presented to me by Miss Is. Forster, which is eight inches in length, and three and a half in breadth, but it rarely exceeds six inches. It is sometimes partially covered with the remains of a thin brown epidermis, but more commonly this is worn off. The body-whorl of the female is more bellied than that of the male, the shell of the latter being beautifully proportioned. "The shell, suspended horizontally," says Dr Fleming, "is employed in the Zetland cottage as a lamp, the cavity containing the oil, and the canal the wick." I have seen it used in the same manner, and for the same purpose, by the fishermen on this coast.

Animal white: tentacula dorsal, flattened, much dilated at the base, the small eyes seated in an incisure on their outer edge near the middle: margin of the cloak plain: syphon canaliculate, plain, speckled with black exteriorly; mouth furnished with a long cylindrical exsertile proboscis containing a slender filiform cartilaginous tongue marked with numerous cross striæ, and surrounded with a sheath of brown muscular fibres: branchiæ in two very unequal plume-like adnate processes laid along the syphonal side of the branchial cavity, and on the opposite side there is an elevated ridge produced by the course of the rectum, which opens on the margin of the cavity with a plain orifice; the interior of the intestine yellowish-brown, and strongly plaited in a longitudinal direction: penis retroflected, large, linear, flattened, obtuse and truncate: foot oval, rugose, straw-coloured: operculum brown, horny, pyriform, marked with concentric striæ.

The nidus of this molluscum is a very curious object. It is firmly attached to rocks in deep water by a broad base, and forms an obtuse cone about three inches high and two in diameter, made up of a number of large cells or pouches joined together by a strong cartilaginous band or skin. Each cell is shaped something like the human nail, convex outwardly and concave on the inner side, the outer coat strong and cartilaginous, with a slit on the upper edge. Within this, and only loosely connected with it,

there is a bag of a similar form, but the coat of which is thin and pellucid, and contains at first a fluid granular matter, clouded at places, and ultimately from two to four young. Previous to exclusion these are perfectly formed: the eyes, tentacula, and operculum of the animal are very distinct, and the shell, which is of a uniform flesh-colour, has three or four whorls, and is fully four lines in length. They ultimately make their escape by a dissolution or rupture of the cells, for there is no aperture in the inner coat, and the slit in the outer one seems intended merely to admit the water necessary to their airing.

2. *F. corneus*, shell fusiform, plain, covered with a brown epidermis, striated spirally; whorls nine, somewhat rounded; aperture oblong, pure white, with smooth lips; canal rather short, bent, wide. Length 3; breadth 1 inch. *Flem. Br. Anim.* 348. *F. islandicus*, *Lam. Anim. s. Vert.* vii. 126. *Murex corneus*, *Linn. Dillw. Rec. Sh.* 733.

Hab. Berwick Bay, in deep water, frequent.

Animal white, unspotted: eyes black and rather large; foot short, very obtuse behind, the margins plain.

3. *F. Bamfius*, shell fusiform, dirty white, with seven convex whorls ribbed across; ribs numerous, acute or lamellar; aperture oval, white, with a bent canal shorter than its length, the outer lip thickish and everted. Length $\frac{7}{10}$ ths; breadth $\frac{3}{10}$ ths. *Flem. Br. Anim.* 351. *Murex Bamfius Penn. Brit. Zool.* iv. 284, tab. 82, fig. 5.

Hab. Berwick Bay, in deep water, rare.

4. *F. Barvicensis*, shell fusiform, white, with six rounded whorls separated by a flattened space at the suture, and crossed with numerous furbelowed ribs; aperture roundish, white, the canal rather long, slightly ascending; outer lip thin, smooth. Length $\frac{6}{10}$ ths; breadth $\frac{2}{10}$ ths. *Johnston*, in *Edin. Phil. Journ.* xiii. 225. *F. asperimus*, *Brown's Conch.* pl. 47, fig. 2.

Hab. Berwick Bay, in deep water, rare.

There are thirteen ribs on the body-whorl, finely furbelowed, projecting a little at the suture, and terminating on the beak, which is produced and smooth towards its extremity. In the space between the ribs there are some obsolete spiral elevations. The ribs do not terminate at the sutures, but are continued across the flattened space by elevated striæ.

Mr J. E. Gray informs me, that this shell is not distinct from the *Murex muricatus* of Montagu: and relative to this opinion, Mr J. Alder of Newcastle has favoured me with some remarks, which I shall give in his own words. He says—"They are very nearly, if not exactly, similar in form, but in none of the specimens of *F. muricatus*, is there any appearance of the beautifully undulating bilaminated ribs which are so conspicuous in your shell. These may possibly wear off, like the imbricated scales of the young *Purpura lapillus*; but Montagu dredged up *M. muricatus*, covered with an orange-coloured epidermis or crust, and probably fresh; and it has been often found since his time, but nobody has ever described it with undulated lamellar ribs, which I think must have been observed had they existed. The tuberculated appearance, from the strong spiral striæ crossing the ribs, seems to be a general character of *M. muricatus*, but can scarcely apply to yours. Indeed, *F. Barvicensis* cannot properly be said

to have any spiral striæ, as they are merely undulations of the ribs, which nearly disappear in the hollows, and on the left side of the ribs, the latter lying over in that direction. The striæ of *F. muricatus* are more distinct, numerous, and regular, particularly toward the base of the shell. The outer lip of *F. muricatus* is strongly tuberculated within: your Berwick shell is smooth in the specimen sent, which however is young." I may add, that I have now examined six specimens, in all of which the lips of the aperture are smooth, and two of the specimens at least appeared to be full-grown.

5. *F. Turricula*, shell white, turreted with eight gradually decreasing whorls flattened at the sutures, crossed with many thickish straight ribs, and spirally striated; aperture oval, with a very short wide canal. Length $\frac{9}{10}$ ths; breadth $\frac{2\frac{1}{2}}{10}$ ths. *Flem. Br. Anim. p. 349.* *Murex Turricula, Mont. Test. Brit. 262. tab. 9. fig. 1.*

Hab. Berwick Bay, very rare.

There are fifteen ribs on the body-whorl, which disappear on the back of the canal. The whorls are flattened, and rise perpendicularly from each other, becoming suddenly plane on the top, the ribs being continued across this flattened space.

6. *F. linearis*, shell fusiform, ribbed transversely and crossed with elevated striæ nodulous on the ribs, the interstices smooth; whorls six or seven, convex, the ribs about ten, and the cross lines eight on the body; aperture oval, the beak shorter than its length, straight, the outer lip thickened, the pillar plain. Length $\frac{1}{10}$ ths. *Flem. Brit. Anim. 350.* *Murex linearis, Mont. Test. Brit. 261. t. 9. fig. 4.*

Hab. Berwick Bay, in sand, not uncommon.

Our specimens are dead shells, procured from among sea-sand. They are whitish, with a purplish apex, and marked spirally with reddish-brown lines, for the spiral striæ are of this colour.

7. *F. costatus*, shell fusiform, slender, of a yellowish-brown colour, smooth; whorls six, transversely ribbed, the ribs nine on the body, slightly waved, obtuse, continuous; aperture oval, with a short wide canal and plain lips. Length $\frac{3}{10}$ ths; breadth $\frac{1}{10}$ th. *Flem. Brit. Anim. 348.* *Murex costatus, Mont. Test. Brit. 265.*

Hab. In shell sand, very rare.

The apical or primary whorls are not ribbed. The shell is very smooth, and somewhat glossy.

8. *F. nebula. Mont. Test. Brit. 267, pl. 15, fig. 6.* *F. pyramidatus. Brown's Conchology, pl. 48, fig. 19, 20.*

Hab. Coldingham Bay, *Mr Robert Maclaurin.* "Found by me at St Abb's Head," *Brown.*

Mr Maclaurin's specimen is an old and worn one, nine lines in length, and three in diameter where broadest, of a dull brownish colour, stained with extraneous matter, opaque and thickish, and appears to have been coated with a yellowish-brown epidermis, minutely reticulated in its fresh condition. The description must consequently be imperfect. Shell turreted, with nine ribbed whorls tapering gradually to a point: whorls very slightly

raised, with nine or ten obtuse smooth ribs, obsolete at the suture, which is a distinctly impressed line. Body-whorl more than twice the breadth of the second, the lower part not ribbed: aperture oval, with a wide effuse short canal bent to one side, the pillar smooth, the lip thin and even. The Berwickshire specimen is considerably larger than any seen by Montagu, but Mr Edward Forbes tells me that he has seen it as large in several collections. Mr Forbes is of opinion, that Brown's *F. pyramidatus* is founded on a worn specimen of this species,—an opinion to which I give a willing assent.

Captain Brown, in his Conchology, figures three new species, which, he says, were found at Holy Island. These are:

Fusus minimus, pl. 48, fig. 35, 36.

Fusus punctatus, pl. 48, fig. 56, 57.

Murex craticulatus, pl. 48, fig. 60.

3. BUCCINUM. LINNÆUS.

Shell ovate, with a produced spire; aperture oval, effuse at the base, not lengthened into a beak; pillar rounded, smooth; outer lip plain: operculum horny.

1. *B. undatum*, shell ovate-conical, thick, white more or less tinged with brown, marked with spiral ridges and striæ, and transversely ribbed; ribs waved, oblique, obtuse, crossing only the upper half of the body; whorls eight, rounded; aperture white, roundish, the pillar smooth, with a thick fold on the outer side of the short canal; outer lip somewhat sinuated, thick. Length $4\frac{1}{2}$, breadth 2 inches. *Linn. Dillw. Rec. Sh.* 632. *Pen. Brit. Zool.* iv. 272. tab. 76. *Mull. Zool. Dan.* tab. 50. fig. 1-4.

Var. 2. Shell thin, covered with a horn-coloured rough epidermis, the spiral ridges and the waved ribs of the body-whorl less distinct. Length $3\frac{3}{4}$ ths; breadth 2 inches. *Buc. striatum*, *Pen. Brit. Zool.* iv. 272. tab. 77. *Buc. br. magnum, tenue, leviter striatum*, *List. Conch.* tab. 962. fig. 15. *Tritonium ciliatum*, *Fabric. Faun. Grœnl.* 401.

Hab. Berwick Bay, about low-water mark, and in deep water, common.

The throat of some of the immature shells is yellow, with the rim thin, crenulate, white or tinged with pink; and I have seen specimens in our bay with a dark purplish-brown aperture, which some have suspected to be a distinct species. These varieties were nearly two inches long.

Our var. 2. Lister has described with accuracy in his *Hist. Anim. Angliæ*, p. 157. tab. 3. fig. 3, where he says it differs from the *B. undatum*—1. because it is very thin and smooth, while the latter is strong and heavy; 2. in having a more ample aperture; and, 3. in the almost total want of the waved lines or ridges on the large whorl. These reasons many naturalists have considered valid; and it has consequently been introduced as a distinct species into our latest Fauna, under the name of *B. Anglicanum*, which again Dr Fleming considers to be identical with the *B. Humphreysianum* of the *Zool. Journ.* v. i. p. 398. tab. 22. But, as Mr Gray has very properly remarked, “the shells of the *Buc. undatum* and *B. striatum* of Pennant have no other difference than that the one has been formed in rough water, and is consequently thick, solid, and heavy; and the other in the still water of harbours, where it becomes light, smooth, and often coloured.”

Animal: tentacula two, triangular, compressed, non-retractile, lateral and superior, abruptly dilated at the base: eyes two, external, small, on the dilated part of the tentacula: proboscis cylindrical, upwards of an inch long, composed of circular fibres, containing fibro-muscular sheath, within which lies the filiform rough tongue: margins of the collar and foot plain: penis large, club-shaped, compressed, with a subterminal mucro: operculum oval, corneous, concentrically striated.

The nidus (*Alcyonium*, seu *Vesicaria marina*, *Ellis*, Corall. 84. tab. 32. b. B.), is composed of numerous cartilaginous vesicles or pouches, united by a strong ligament into a roundish mass, which, in size and general appearance, may be aptly compared to the nest of the humble bees. The pouches are essentially the same in structure as those of *Fusus antiquus*, and each contains about four young, which, when about to be hatched, have four whorls, and exhibit all the characters of the shell in perfection. Some authors have supposed that they constitute the *Murex decollatus* of Pennant (*Br. Zool.* iv. 286. tab. 82. fig. 3.); but the latter is really the fry of *Fusus antiquus*.

At the enthronization feast of William Warham, Archbishop of Canterbury, on the 9th of March 1504, there were provided 8000 whelkes, at 5s per 1000. They are not eaten on this coast, but are still exposed in large quantities for sale in the markets of the metropolis. Our children amuse themselves with the shell, which they apply to the ear, and, by attentively listening to its murmurings, they tell whether the tide flows or recedes!

" I have seen

A curious child, who dwelt upon a tract
Of inland ground, applying to his ear
The convolutions of a smooth-lipp'd shell;
To which, in silence hush'd, his very soul
Listen'd intensely, and his countenance soon
Brighten'd with joy; for murmurings from within
Were heard,—sonorous cadences, whereby,
To his belief, the monitor express'd
Mysterious union with its native sea."

2. *Buc. breve*, shell ovate-ventricose, whitish, faintly banded with reddish-brown, ribbed transversely, and spirally striate; whorls five, rounded, the three apical smooth, apex obtuse; aperture oval, the lip plain, the pillar twisted. *Adams*.

Hab. In sand. Berwick Bay.

There is a faint brown band on the upper and lower margins of the body-whorl. The shell resembles the fry of *Buc. undatum*, but is different; for there are five distinct whorls in this, which is not more than a line in length, whereas there are four only in *Buc. undatum*, when it is three or four times of greater size. This shell is also more transparent, with the ribs better marked, and the striæ less so.

4. *NASSA*. LAMARCK.

Shell ovate, with a produced spire; aperture roundish or oval, with a short canal; pillar rounded; outer lip thickened with a strong external rib or varix: operculum horny.

1. *N. incrassata*, shell ovate-conical, brown, with seven whorls ribbed across and spirally grooved; ribs obtuse; aperture white, the pillar concave, outer lip toothed within, canal very short, oblique, with a black spot at the end, and a furrow between the body and

the outer fold of the pillar. Length $\frac{6}{10}$ ths. *Flem. Brit. Anim.* 340. *Buccinum macula*, *Dillw. Rec. Sh.* 638.

Hab. Berwick Bay, at and within low water mark, frequent.

"The shell has frequently a red band on the centre of the body-whorl; and a beautiful variety is sometimes found entirely red."—*Mr J. Alder.*

Animal straw-coloured, speckled with black; tentacula setaceous, bulged at the base, the eyes placed half-way up on their outer side; syphon long brown speckled and black near the base, either straight and projected, or retroverted and laid on the back of the shell when in motion; foot and collar plain: mouth with a long proboscis, thicker towards the apex, and, as usual, furnished with filiform striate tongue. The animal is active, and tolerably quick in progression.

5. PURPURA. LAMARCK.

Shell oval, thick, ribless; aperture dilated, ovate, with a short wide canal; pillar flattened; outer lip without a varix: operculum horny.

1. *P. Lapillus*, shell ovate-acute, white, obsoletely ridged in a spiral direction; whorls six, those of the spire small, the suture obscure; aperture oval, tinged with purple, the outer lip thick, toothed within; pillar plain, with a thick fold at the base. Length $1\frac{1}{10}$ ths, breadth $\frac{7}{10}$ ths. *Lam. Anim. s. Vert. vii.* 244. *Flem. Brit. Anim.* 341. *Buccinum lapillus*, *Linn. Dillw. Rec. Sh.* 613. Purple Fish, *Cole* in *Phil. Trans. xv. ann.* 1685, p. 1278, tab. 3. fig. 3-8.

Hab. Berwick Bay, between tide marks, abundant.

Immature shells are often marked with bands of brown or yellow, and the spiral ridges or ribs are roughened with scales, a variety which constitutes the *P. imbricata* of Lamarck.

Animal; tentacula 2, dorsal, tapered, flattish, dilated below the eyes which are inserted in an incisure near their middle and on the outside: mouth with a short proboscis: margin of the cloak plain, marked with a brown band; foot short, plain, oval, the brown horny operculum placed on its back; branchiæ in two very unequal pectinated processes adnate to the syphonal side of the respiratory cavity; penis flat, curved, retroflexed, obtuse, with a terminal mucro.

The nidus of this animal is very different from that of *Fusus* or *Buccinum*; and we may add from the typical *Purpuræ*, from which our shell has been separated by Mr Swainson, and placed in his new genus *Polytropa*. It is described by Ellis (*Corall.* p. 87. tab. 32. fig. c. c.) as an "*Alcyonium, seu cyathus marinus*," and is in the form of a wine-glass or vase, adhering by a broad base, and hanging in general from the roof of shelving rocks in considerable clusters. "When they are first taken out of the sea, they are of a bright semi-transparent yellow colour, of a horny tough nature, containing a viscid substance, with many orange-coloured seed, or egg-like particles, in the upper part of each cup," and in which the little shells, completely formed, are soon to be detected with the magnifier. Each nidus is distinct or separate, with a short narrow neck, and the upper part oval, containing the ova or young covered by a convex lid, which at length opens to admit of their escape.

On the back of the snail there may be observed a pale-coloured vessel winding obliquely backwards, and filled with a liquor of the colour and consistence of cream. This liquor affords an indelible dye of a fine purple colour, analogous or perhaps identical with the Tyrian purple of antiquity. The

venerable Bede, who died A.D. 735, mentions the fact in a manner which proves it to have been familiarly known in his time, when, in all probability, it was really used as a pigment. "There are," says he, "on the English shores an abundance of the *Cochleæ* which yield a scarlet dye. Its beautiful tinge neither fades by the heat of the sun nor by the weather, but the older it is, the more rich and elegant." The knowledge of the fact appears soon to have become confined to a few individuals who handed down the manner of marking linen with it as a family secret; nor was it again made public until 1684, when Mr William Cole of Bristol, having been informed that "there was a certain person living by the sea-side, in some port or creek in Ireland, who made considerable gain by marking with a delicate durable crimson colour, fine linen of ladies, gentlemen," &c., and which was "taken out of a shell-fish," discovered after various trials, that it was procured from the *P. Lapillus*.

The fluid, when in the vessel, as already mentioned, is of the colour and consistence of cream. As soon as it is exposed to the air, it becomes of a bright yellow, speedily turns to a pale green, and continues to change imperceptibly, until it assumes a bluish cast, and then a purplish-red. Without the influence of the solar rays, it will go through all these changes in the course of two or three hours; but the process is much accelerated by exposure to the sun, which also causes the cloth tinted to exhale a very strong fetid smell, "as if garlic and assafoetida were mixed together." We strongly recommend," says Montagu, "the use of this secretion for the purpose of marking where an indelible dye is desirable; letters marked on linen or other articles of wearing apparel, from the recent animal, appear indestructible, bidding defiance to chemical process."

6. CYPRÆA. LINNÆUS.

Shell convolute, ovate, bellied, the spire minute or concealed; aperture linear, parallel with the length of the shell, effuse at both ends, toothed on each side, the outer lip thickened and involute.

1. *C. europæa*, shell ovate-globose, ash or flesh-coloured, crossed by numerous smooth ribs; spire obsolete; base white; the aperture linear with equal teeth; outer lip thickened, rounded. Length five lines, breadth under three. *Dillw. Rec. Sh.* 467. *Gray in Zool. Jour.* iii. 366. *C. pediculus*, *Pen. Br. Zool.* iv. 252. tab. 73. fig. sup. *C. coccinella*, *Lam. Anim. s. Vert.* vii. 404.

Hab. Berwick Bay, at low water mark.

"The variety found on our coast is the *C. artica* of Montagu, *Test. Brit.* 201."

Mr J. Alder. The shell is frequently cast up in our bay, and gathered by the children, who call it sea-cradles or blackamoor's teeth.

Animal: tentacula two, filiform or slightly tapered, inferior, orange-yellow with pale dots, white and incrassated at the base, the eyes being placed just above and on the outer side of this basilar portion; mouth furnished with a ribbon-like membranous tongue roughened with minute prickles set in close transverse lines; syphon projected forwards, tubulous, cleft underneath, white tipped with yellow; cloak covering the shell more or less completely, pellucid, white spotted with yellowish-brown, the edges plain and spotted with black; foot oblong, extended beyond the shell when in progression, broad and truncate in front, produced into two short processes at the anterior angles, rounded posteriorly, sometimes white tinted with yellow on the sides, and sometimes entirely orange-yellow. The snail can withdraw entirely into its shell. It creeps slowly, and exudes a large quantity of a clear colourless jelly during its progress. When kept in a glass of sea-water, its favourite position was near the

surface at the edge, round which it crawled, with the shell reversed, and the foot fixed obliquely to the glass, partly supported by the pellicle of jelly it had excreted. The syphon is projected forwards, the tentacula expanded, and the shell covered with the cloak which, when thus expanded, seems impressed with striæ like the shell itself. It sometimes left the water altogether, and seemed nowise incommoded by the change.

The immature shell (*Cypræa bullata*, Ment. Test. Brit. 202, tab. 6, fig. 1) is milk-white, smooth, thin and pellucid, with a wide aperture effuse at the base, and a small spire projecting at the top, having exactly the form of a volute. The animal differs from the adult merely in the less evolution of the cloak.

List of Bivalved Shells found in Coldingham Bay. By Mr ROBERT MACLAURIN.

Fam. OSTRACEA.

<i>Anomia ephippium.</i>	<i>Anomia undulata.</i>
——— <i>squamula.</i>	

Fam. PECTENIDÆ.

<i>Pecten maximus</i> (not common)	<i>Pecten varius</i> (rather common)
——— <i>opercularis</i> (not common)	——— <i>obsoletus</i> (very common)
——— <i>lineatus</i> (rare)	<i>Lima fragilis</i> (rare)

Fam. ARCEA.

<i>Arca fusca</i> (very rare)	<i>Nucula margaritacea</i> (common)
<i>Pectunculus pilosus</i> (not rare)	——— <i>minuta</i> (not common)

Fam. MYTILACEA.

<i>Mytilus edulis</i> (very common)	<i>Modiolus vulgaris</i> (common)
var. <i>incurvatus</i> (rare)	——— <i>discors</i> (common)
var. <i>pellucidus</i> (common)	——— <i>discrepans</i> (rare)

Fam. CONCHACEA.

<i>Cardium ciliare</i> (not common)	<i>Kellia suborbicularis</i> (common)
——— <i>echinatum</i> (common)	<i>Crassina Danmonia</i> (common)
——— <i>lævigatum</i> (not common)	——— <i>Scotica</i> (common)
——— <i>edule</i> (not common)	——— <i>sulcata</i> (rare)
<i>Donax trunculus</i> (very rare)	<i>Cytherea exoleta</i> (very common)
——— <i>nova species?</i> (very rare)	<i>Cytherea linctæ</i> (common)
<i>Tellina tenuis</i> (common)	——— <i>ovata</i> (rare)
——— <i>solidula</i> (common)	<i>Venus cassina</i> (rare)
——— <i>crassa</i> (very common)	——— <i>fasciata</i> (common)
<i>Amphidesma compressa</i> (not com.)	——— <i>gallina</i> (very common)
<i>Cryptodon flexuosus</i> (very rare)	——— <i>virginea</i> (not common)
<i>Lucina radula</i> (very common)	——— <i>decussata</i> (not common)
——— <i>undata</i> (common)	——— <i>perforans</i> (very common)
<i>Cyprina islandica</i> (common)	<i>Corbula striata</i> (common)
<i>Mactra subtruncata</i> (not common)	<i>Lutraria elliptica</i> (very rare)
——— <i>elliptica</i> (common)	——— <i>hyans</i> (very rare)
——— <i>solida</i> (very common)	<i>Mya truncata</i> (rare)
——— <i>stultorum</i> (very rare)	——— <i>arenaria</i> (not common)

Sphenia Swainsonii (<i>common</i>)	Solen ensis (<i>common</i>)
Anatina pubescens (<i>very common</i>)	——pellucidus (<i>rare</i>)
Psammobia florida (<i>not common</i>)	Hiatella rugosa (<i>not rare</i>)
——Ferroensis (<i>common</i>)	——arctica (<i>not common</i>)
Solen siliqua (<i>common</i>)	Pholas crispata (<i>very rare</i>)

Of the *Pholas crispata* I have seen a living specimen, which is now in the possession of Mr J. Duncan, Eyemouth. The whole of the shells in the preceding list have been found in a living state, with the exception of *Arca fusca*, *Pectunculus pilosus*, *Cardium levigatum*, *Mactra stultorum*, *Venus cassina*, and *Mya truncata*. They have been procured principally from the fishermen's lines. The coast where they live is very rugged, and very unfavourable to the growth of such species as prefer quiet and sheltered sandy shores. We thus find, that the distribution of the Mollusca is quite characteristic of the district. *Donax trunculus*, *Tellina tenuis* and *solidula*, *Mactra stultorum*, and *Amphidesma compressa*, which are abundant on every sandy beach in the kingdom, are of comparatively rare occurrence with us. A stripe of sand, a mile from the shore, runs east and west, from St Abbs. This abounds with *Mactra solida* and *elliptica*, *Crasina compressa*, *Lucina radula*, *Tellina crassa*, *Pecten obsoletus*, *Cardium edule*, *Cytherea exoleta*, *Solen siliqua* and *ensis*.

Beyond this, and extending many miles in breadth, the bottom of the sea consists entirely of *mud*, or of mud and sand. This habitat, though far from being so rich in species as the former, is preferred by *Venus decussata* and *perforans*, *Mya truncata*, *Lutraria elliptica*, and *Modiolus vulgaris*, which last obtains a great size, frequently growing seven inches long.

As we go farther from the shore the mud disappears, and we come to a rocky bottom which is adjacent to the cod banks. In this situation we find *Cardium echinatum*, *Cyprina Islandica*, *Venus cassina*, &c. The cod banks are the abode of *Pecten maximus* and *opercularis*, together with many species which abound in the first mentioned bed.

ROTTBOLLIA INCURVATA, var. *filiformis*. This grass has been found on the Links beyond Goswick, N. Durham, plentifully, by *Miss E. Bell* and *Miss Hurton*.

Erratum in last No. of Transactions of Berwickshire Naturalists' Club.

Page 180, line 3 and 4 from top, for perhaps read particularly.

The Anniversary Address to the Berwickshire Naturalists' Club, delivered at Kelso, 15th September 1841. By FRANCIS DOUGLAS, M.D., President.

GENTLEMEN,

PREVIOUS to resigning the honourable situation to which I was elevated at the last Anniversary Meeting of the Club, I must discharge the usual duties of your President, by giving an account of the transactions of the Club, during the year which has now expired.

The 10th anniversary meeting of the Club took place at Holy Island on the 30th of September, when the following members attended ; Dr Johnston, P. J. Selby, Esq., Dr Clarke, Captain Mitford, Mr Melrose, and F. J. W. Collingwood, Esq. The Club were honoured with the company of the Rev. J. Dixon Clarke, Messrs Hubback and Heath, Barristers, and Mr Alexander Douglas, from Kelso.

After breakfast, a letter addressed to the Secretary of the Club from Chevalier Michelotti of Turin was read. It conveyed an offer of the Fossils of Italy, belonging to the Tertiary period. It was a matter of regret that this handsome offer could not be accepted, in consequence of one of the fundamental rules of the Club forbidding the acquisition of any property ; “but it was a flattering unction to their consequence and importance to know, that their name and fame had spread beyond the land of brown heather, and was cherished even in the land of the vine and the myrtle.” The walk of the Club was directed towards the Coves, where an hour or two was busily devoted in searching out and noting the various marine animals which lurk beneath the flat stones in “*Coveshaven*.” The Coves are excavated in a very picturesque sandstone cliff, of about 200 yards in length, and 35 feet in height : three of them are of considerable size and interest ; their walls are covered with a dense coat of the *Polysiphonia stricta*, which gives them the appearance of being papered with a rich scarlet cloth. In former times, they were the resort of numerous flocks of seals, which took, in those cool recesses, their repose without fear of surprise ; but they have now forsaken their ancient haunts, expelled by the too frequent visits of lovers of the picturesque or of poaching, and by the revels of pleasure parties and Picknickians. A few rarities were found in the haven, of which the following may be specified. —Of Algæ, the only one worth notice is *Zonaria deusta*, which spreads like a lichen over the rocks in great profusion. The *Millepora lichenoides*, the *Melobesia*, and *Corallina officinalis*, occurred in every pool ; and it was easy to demonstrate by the different staged

specimens there, that these productions were merely different states of one species. The *Halysarca* of Dujardin, perhaps the lowest of animal organizations, was noticed in much abundance and perfection; and we could easily imagine, that, by the addition of siliceous spicula, immersed and crossed in its texture, it might become the *Halichondria panicea* of Fleming, which grew alongside of it in several varieties.—Of the calcareous sponges, there were met with *Grantia coriacea*, *botryoides*, *foliacea*, and a singular variety of *G. ciliata*.—Of Zoophytes, *Coryne squamata*, *Laomedea gelatinosa*, *Sertularia pumila*, *Lepralia coccinea*, *Actinea mesembryanthemum*, abounded, and in especial perfection and beauty.—Of the Echinodermata, no other species than *Echinus esculentus*, *Ophiura fragilis* and *neglecta*, occurred. The *Echinus* was generally hidden by broken pieces of sea-weed, with which it covered its shell.—Of the *Mollusca tunicata*, there were many species remarkable for their beauty, but we can only specify the *Ascidia rustica*, *Phallusea intestinalis*, and *Aplidium ficus*, for of the others the names could not with certainty be determined. The calcareous stones were often found perforated with *Pholas crispata*, and one stone was found by Captain Mitford, with many of the shells still living hidden in their excavations. In one of these holes, a good specimen of *Venus perforans* was found; and the *Saxicava rugosa* was not uncommon. A great number of specimens of *Lamellaria tentaculata* of Montagu were taken, shewing that the species is liable to considerable variation in colour, and in the degree of roughness of the mantle.—Several very minute individuals of the *Doris tuberculata* were taken up unnoticed, until after our return home, and it is remarkable that in these, some of which were an eighth of an inch in length, there was no appearance of branchiæ. Another member of the family Doridæ occurred, which is without exception the most beautiful naked gasteropode we have seen; its name remains for future investigation.

Passing from the Haven, the party next crossed over a formation of limestone, consisting of three beds, from three to four feet each in thickness, which, at the point to the eastward of the north sands, assume a singularly undulated appearance. Mr Skafe has given a very brief description of these, and a figure, illustrative of their undulations, in Raine's History of North Durham, p. 172. Thence we walked to the Snook, to the spot where Mr Donaldson Selby is boring for coal. Here the party separated, one division walking towards the village in as direct a line as possible, that they might have leisure to examine the Priory, Church, and Castle; another set, bent on the murder of rabbits and partridges, wandered over the links and fields in many a devious track; while a third set wandered leisurely round by the loch in search of rarities in any class or kingdom of animality, but they were as little successful as their murderous or sporting colleagues. At dinner the party were reunited, and afterwards, as is our wont, the Secretary

read the address of the President, who was prevented from attending by absence from home. On the nomination of Mr Selby, Dr F. Douglas was elected President for the ensuing year. A notice of the occurrence of the *Halichærus gryphus* on the coast, by Dr Douglas, was next read, on which Mr Selby was requested to report at the next meeting. Dr Johnston was appointed Secretary for the year.

At the Winter Meeting at Berwick, held on December 16, the following members attended: Dr Douglas, president; Dr Johnston, secretary; Rev. Thos. Riddell, Mr Melrose, Dr Clarke, Mr Selby, Mr Good, Rev. J. Turnbull, and Mr Langhorne. Mr Tancred, Mr Wm. Tancred, and Mr Wilkie of Fouldean, attended as visitors. The members of the Club having partaken of Dr Johnston's hospitality at breakfast, the minutes of the last meeting were read and approved of. Mr Selby then reported that the seal described by Dr Douglas, in a communication read to the Club in September last, was, as Dr Douglas supposed, the *Halichærus gryphus*, and that he had since procured three specimens of the heads of the same species from the Farne Island, where Mr Selby now believes the *Phoca barbata*, for which the *Halichærus* had been mistaken, is not to be found.

On the motion of Mr Selby, the Rev. J. D. Clarke, and on the motion of Mr Riddell, Mr David M'Beath, were admitted members of the Club. It was next agreed that the Club should meet in 1841, at the following places in succession, Ayton, Wooler, Bank House, and Kelso.

Mr Selby presented the Club with a list of the dipterous insects in the collection of Mr Hardy, made in the neighbourhood of the Pease-bridge, and with a notice of *Larus minutus*, killed at Holy Island. Mr Selby subsequently read an elaborate report on the ornithology of Berwickshire, which was ordered to be printed. Dr Johnston gave in a few ornithological notices of the occurrence of some rare birds in the neighbourhood of Berwick.

The Club then took their walk along the sea-banks as far as the Needle-Eye; but nothing to attract their special attention occurred, beyond what arose out of the beauty and picturesqueness of the sea, and many points in the rocky shore.

After dinner, the party again assembled at Dr Johnston's, who exhibited his collection of British Sponges, and gave a short explanation of the views of Grant, relating to their physiology and functions, and of whose correctness and accuracy in observation he has fully satisfied himself.

The Spring Meeting of the Club was held at Ayton on the 5th of May, and was attended by the following members: The President, the

Secretary, P. J. Selby, Esq., Rev. A. Baird, Dr Clarke, Rev. G. Cunningham, and the Rev. J. Turnbull. The Rev. Mr Tough of Ayton honoured the Club with his company at dinner.

After breakfast, the party took the usual walk, strolling first through the grounds in front of Ayton House, and following the course of the river Eye, until they reached Mill-Bank paper-works, which they were permitted to examine. From this they traced up a certain length of the ravine through which the Aleburn winds its tortuous way. During this walk, nothing new, either to the Fauna or Flora of the district, occurred, and nothing very rare. A few fruit-bearing mosses were picked up, a few insects captured, and one or two shells, uncommon in the district, as *Bulimus obscurus* and *Helix pygmæa*, taken. The walk was, however, very agreeable; for, as the day was fine, the glow of spring-flowers, the rich verdure of the trees, and of the springing grass, the songs of the birds, and the murmuring of the waters of the stream, as it trotted over its gravelly bed, and its deep stillness as it lingered at the foot of precipitous whin-clad rocks, that rose abrupt from the water, came with a healing power on every heart, filling it with a pure feeling which welled forth in peace, and gaiety, and good-will to all men. Chaucer has aptly painted the scene we walked in, but has apparently been as much at a loss as ourselves to describe the feelings it calls forth, just because of their fulness and blended natures.

“ Who sawe evir so feyr or so glad a day,
 And how sote this seson is entring into May?
 The thrustelis and the thrushis in this glad mornynge,
 The ruddok and the goldfynch,
 His amorous notis, lo! how he twynith small!
 Lo! how the trees grenyth that nakid wer, and nothing
 Bare this month afore but their sommer clothing!
 Lo! how Nature makith for them everichone!
 And as many as ther be he forgettith none!
 Lo! how the seson of the yere and Averell showris
 Doith the bushis burgyn out blossoms and flowris!
 Lo! the prymerosis how fresh they ben to sene!
 And many othir flowris among the grassis grene.
 Lo! how they spryng and sprede, and of divers hue!
 Beholdith, and seith both rede, white and blue!
 That lusty bin and comfortabill for mann'ys sight;
 For I sey for myself it makith my hert to light!”

This walk gave us also zest and appetite to enjoy the very good dinner that awaited our return to the village; and, after a talk more pleasant than wise, we separated in the pleasing hope of meeting again together at Wooler on the 16th of June, to talk of the beauties of Nature, and draw, from new and equally agreeable strolls, the best of all arguments of the use of Natural History. At Wooler, accordingly,

in June, the Club met, and the number of members who were present proved that the place of rendezvous was well chosen. Dr Douglas, president, Dr Johnston, secretary, Rev. J. Baird, P. J. Selby, Esq., Dr Clarke, Rev. T. Knight, Fred. Collingwood, Esq., Mr Melrose, Mr M'Beath, and the Rev. J. D. Clarke, attended, and were joined by the Rev. H. Grey, and H. Knight, Esq., as visitors.

The morning-walk was towards Wooler Common, which was traversed in different directions; when the members crossed the moors so as to come down upon Cold-gate Burn. The course of this sweet trouting stream was followed until its entrance into the Wooler water, which the members walked upwards towards Langleyford, loitering away the hours in the fine valley between that place and Middleton. The Club then returned by the usual road to Wooler. During the walk, nothing new for observation was met with. A gentle rain fell during the whole time; but any inconvenience to which it put the members was uncomplained of, for they were too sensible of its need to the crops of corn, and too grateful for its certain benefits, to heed a wetting. Many rather rare plants, which were previously known to be denizens of the district were again noticed, such as *Listera cordata*, *Genista anglica*, *Myosotis caespitosa*, &c. and specimens of several mosses, in a remarkably fine condition, were picked. One of these, *Bartramia fontana*, attracted general admiration, from the beautiful softness of its green foliage, and the elegance of the round apple-like capsule which surmounted the stem. The insects observed, owing to the unfavourable nature of the day, were remarkably few. The Ring-ouzel was observed in its breeding ground, on the sides of the hills rising from the Cold-gate Burn.

After dinner, Mr Collingwood exhibited a piece of animal fat or adipocere found in a peat-bog near Old Yeavering, about three feet under the surface. The mass, when found, was 9 inches long, 6 broad, and 6 deep, with an irregular surface.

On the 28th of July, the Club met at Bank House, when, notwithstanding the fineness of the weather, there was a very scanty attendance; the only members present being Dr Douglas, president; Dr Johnston, secretary; and Mr Melrose. After a comfortable breakfast, the members sallied forth to take their accustomed walk. The Pease Bridge and Glen having been visited on former occasions by the Club, the route taken on this occasion was in the direction of Abbey St Bathans, over moors the greater part of the way. The waters of the Eye were traced for some distance; but their banks proving very uninteresting, the members proceeded to the extensive moor lying between the Eye and the Whitadder. The *Erica cinerea* raised its beautiful bell-shaped blossoms above the surrounding turf, the richness of its

colours putting to the blush many of our highly prized exotics. The route homewards from Abbey St Bathans was somewhat varied; but nothing worthy of notice occurred. The members, however, enjoyed the delight of respiring the fresh air of the hills, and carried on an unceasing conversation, on a variety of subjects, until their return to the inn.

After dinner, Dr Johnston communicated to the Club that he had received the interesting notice of the discovery of *Linnæa borealis* in Berwickshire, specimens of which were laid on the table. It was discovered seven years ago by Mr Dunn, gardener at Mellerstain; but for the notice, the Club is indebted to Mr Hislop, teacher in the Normal Schools of Glasgow. "The *Linnæa* occupies a space of about 150 yards in a fir-wood near Lightfield Farm, Mellerstain." It was, when Mr Hislop visited the spot, in the middle of July, just going out of flower; but several specimens in that state were gathered. The time of flowering is stated in our British Floras to be in May and June, but this period would appear to be too early for our district; "and as a pilgrimage to the habitat of a plant which commemorates the immortal name of Linnæus," says our worthy Secretary, "seems to be almost a sacred duty on the part of our Club, I would respectfully suggest the propriety of fixing our next year's June meeting at the village nearest to it."

Such, gentlemen, is an account of the proceedings of the Club during the eleventh year of its existence, derived chiefly from the minutes kept by the Secretary. From the preceding report, it would appear that the past year has not been very prolific in discovery; yet enough has been done to shew that even on ground previously and carefully searched, objects have escaped observation which another and more scrutinizing visit might bring to light; and as there are yet many localities within the limits of the Club unvisited, it may not unreasonably be expected that new and important discoveries may be made in the Flora and Fauna of Berwickshire. One very interesting addition to the former has been very recently made by Mr Marshall, gardener at Cheek-Law, near Dunse, who has drawn from its lurking place in Dowlaw Dean the *Herniaria glabra*, a small procumbent plant, not only new to Berwickshire, but to the Scottish Flora, and equally remarkable for its occurrence in one solitary spot in England. The fact that two very interesting additions to the phenogamic Flora of the district have been made during the last year, is an additional incentive, were any such wanting, for continued exertion, which will doubtless not go unrewarded.

That, as a branch of education, Natural History should not be more taught in our Schools and Academies, is a subject of great regret.

Teachers would find it highly useful in the moral and intellectual training of children to call their observant faculties into action, and to point out to their opening minds the beautiful and wonderful adaptation of means to particular ends, which are constantly to be observed in the works of creation. It cannot surely be undeserving the attention of man to investigate and enquire into the nature and uses of objects, which the Almighty has in his infinite wisdom thought fit to call into existence. Habits of observation and discrimination are those which teachers so constantly labour to instil into their pupils, and from no study would they derive more assistance in forming their minds than from Natural History, a science wholly dependent on accuracy of observation and correctness of discrimination. To many men it has through life been matter of deep regret, that less attention had been paid to their early education in this respect. Men are often placed in circumstances in which such knowledge would not only prove agreeable but highly advantageous to them; and had Natural History no other charm, it tends to raise the thoughts and exalt the mind of man from grovelling pursuits to a contemplation of the Author, not only of his own existence, but of the whole material universe.

NOTE.—The naked nudibranchial mollusk alluded to in p. 244, is described in Dr Johnston's MSS. under the name of *Polycera Lindisfarniæ*, but it is probably a variety of the *Polycera cristata* of Alder in the Annals of Natural History, vol. vi. p. 340, pl. ix. fig. 10, 11; the description of which was not published at the date of the Club's meeting.

Report on the Ornithology of Berwickshire, and district within the limits of the Berwickshire Naturalists' Club. By P. J. SELBY, Esq. of Twizell-House.

A DISTRICT so varied as Berwickshire, and those portions of North Durham and Northumberland included within the limits of our Club, where a rich productive country, celebrated for the excellence of its agriculture, is intersected by numerous denes and gills, each containing or affording a channel to a clear and limpid stream of less or greater magnitude, and having their steep sides sometimes fringed with wood of ancient or more recent date, at others, clothed with the rich and golden blossoms of the whin and broom, with tangled copse of briar, black-thorn, and sweetly-scented May; where extensive woods surround and beautify the numerous seats dispersed throughout its whole extent, and whose holms and haughs are intersected by *fair* Tweed, the Till, and the Eye; whose upland districts are of that wild character which suits the habits of that truly British species, the Red Grouse, and other alpine birds; whose seaward line, from Berwick to its northernmost extent, is bounded by bold precipitous cliffs, which reach their highest altitude at the beetling and far-famed promontory of St Abb's Head, affording a secure and appropriate breeding retreat to many of our aquatic summer visitants, while the low and slaky shore that extends from Berwick Bay to Fenham Flats, becomes the resort of our aquatic winter visitants;—may naturally be expected to present a numerous ornithological list, and to contain a large proportion of the British birds; and this we think must be allowed, the annexed list exhibiting a return of nearly two-thirds of the birds recorded as British.

Upon analyzing the contents of the list, and commencing with the Raptorial Order, we find twelve species belonging to the Falconidæ, six of which are residents, the remainder coming under the denomination of occasional visitants: of the latter, several instances of the cinereous or great sea-eagle (*Haliaëtus albicilla*) have occurred within our precincts. All the examples of this kind that I have seen and examined have been in immature plumage; a circumstance, however, not at all remarkable, as the adults, when once paired, rarely leave the immediate vicinity of the eyry they have selected, and the young, after quitting the nest, are always driven from the district in which they have been bred by the parent birds. The frequent appearance of this species in lowland districts, as compared with that of the golden eagle (*Aquila Chrysaëtos*), may be attributed to its maritime and coasting habits, the latter affecting the mountainous island districts, from which it rarely strays. Of the osprey (*Pandion haliaëtus*),

a species still more aquatic in its habits, only one instance, within our limits has yet occurred: its rarity, however, is sufficiently accounted for from the paucity of the bird throughout Britain. The honey buzzard (*Pernis apivorus*) and ash-coloured harrier (*Circus cineraceus*) are equally rare; a single specimen only of the latter has yet occurred. The peregrine falcon (*Falco peregrinus*) is more frequently seen, and one eyry, at least, is known to most of our members, in the lofty precipice a little to the north of St Abb's Head. Of the Strigidae or owls, there appear to be four species, three of which are resident, and one periodical winter visitant: of the former, the *Otus vulgaris*, long-eared owl, and *Strix flammea*, barn owl, are both well known and abundant; the third, the *Uhlula stridula*, tawny owl, though formerly a common species, is now rarely met with. The short-eared owl, *Otus brachyotos*, arrives in November, and is frequently met with upon the moors or open fields in rushy ground, where it roosts concealed during the day, except in dark foggy weather, when we have frequently seen it hawking at noon.

Of the Fissirostral tribe, belonging to the order Insectores, the list contains five periodical summer visitants, and one occasional visitant; of the former, four belong to the swallow family, and one to the goatsuckers. The occasional visitant is the kingfisher, more remarkable for the richness and beauty of its plumage than the gracefulness of its form. The window swallow, or, as it is frequently called, the white-rumped martlet, breeds in great numbers in the rocky precipices north of Eyemouth, and at St Abb's Head; these appear to be the natural breeding situations of the species, the eaves of houses and corners of windows being only resorted to where the others are deficient. At Inchnadamff, in Sutherland, we recollect observing the species breeding in great numbers about the precipitous face of the limestone or marble mountain of that district.

Of the Dentirostral tribe of the same order, we enumerate fifteen permanent residents, seventeen periodical summer visitants, two periodical winter visitants, and three occasional visitants. Among the residents, the missel-thrush, which in our younger days was considered a very rare bird, has now become common, and during spring and summer may be heard around every residence uttering its broken lay, which, though loud and sonorous, is greatly inferior in compass and sweetness to that of its congener, the gentle mavis.

Among the periodical summer visitants, the Sylviidae, or warbler family, not less interesting for their vocal powers than for their active and lively habits, occupy a prominent station. Among the rarer species we reckon the greater pettychaps (*Curruca hortensis*), whose notes are rich and liquid, many of them emulating those of the night-

ingale; the grasshopper warbler (*Salicaria locustella*), and the little pettychaps (*Sylvia hippolais*). Other species also, we have remarked of late years, do not abound to the extent they formerly used to do: such is the case with the sedge-warbler (*Salicaria phragmitis*) and white-throat (*Curruca cinerea*), and the whinchat (*Saxicola rubetra*). This defalcation we are inclined to attribute chiefly to the effect of an improved system of agriculture, which, by draining and reclaiming the marshy spots, and little tangled thickets of willow, and other rough and rampant herbage that used to be so common in many of our fields, and the attention that is now paid to the cleansing of hedges, which are annually divested of their weeds, has destroyed the favourite and appropriate breeding-places of the birds, and may probably also, in so doing, have lessened the supply of some peculiar insect food, necessary to their own economy, or that of their young.

Among the occasional visitants is the *Lanius excubitor* (great butcher bird), which is only seen during the autumnal and winter months; and that beautiful member of the Ampelidæ, the Bohemian waxwing (*Bombycilla garrula*); most of our members will recollect the graceful actions and appearance of the beautiful specimen so long alive in the possession of Dr Johnston. The appearance of this species is very uncertain, and sometimes many years elapse without the occurrence of a single individual. Of the Fringillidæ, we enumerate nine permanent residents, three periodical winter visitants, and three occasional visitants. Among the periodical winter visitants, the snow-flake (*Plectrophanes nivalis*) sometimes appears in great numbers, particularly in the upland districts, where they haunt the open grassy tracts as well as the oat-stubbles; in storms of snow they descend towards the coast, where small flocks of adult males are often seen together, the females and young birds keeping by themselves, and generally in larger bodies. The mountain finch (*Fringilla montifringilla*) is another winter visitant from the Arctic Regions, and in some seasons is very numerous. It often associates with the chaffinches, to which it is nearly allied; but may be distinguished from it by its note, call, and superior size. Of the occasional visitants, the siskin (*Carduelis spinus*), an elegant little bird, is sometimes very abundant during the winter and early spring months; it is generally seen where the birch and the alder abound, as the seeds of these trees are its favourite food; on this account it is most frequently seen on the banks of our rivers and burns, where the latter tree usually grows. The crossbill is another bird whose visits used formerly to be at very uncertain intervals, but which, of late years, has almost assumed the habits of a permanent resident, and has been found breeding in the island; this change of habit we attribute to the extensive plantations spread over the king-

dom, most of which contain a large proportion of the fir tribe, the seed of which is its chief subsistence.

The only member of the *Sturnidæ** is the common starling, which we note as a permanent resident, for, though it changes its feeding-ground according to the seasons, it never appears to be far distant, as we observe the few pairs that nidificate at Twizell frequently visit their haunt during winter, and when not engaged in incubation. The members of the *Corvidæ*, or crow family, are eight in number, all of which are permanent residents, except the Royston or grey-backed crow (*Corvus cornix*), which is here a periodical winter visitant, its summer retreat being the northern parts of Scotland, Norway, &c. In its form and habits it is intermediate between the carrion crow (*Cor. corone*) and the rook (*Cor. frugilegus*), though, we believe by Dr Fleming, it is still considered as a mere variety of the former, an opinion in which, it is scarcely necessary to say, we do not acquiesce : as a species, it seems to us as well marked as any in the genus. The jay, one of the handsomest members of the family, is thinly disseminated in the district, a few are generally resident in the larger woods, such as those of Detchant, Fenwick, Kyle, &c. The red-legged chough (*Fregilus graculus*) another of the family whose distribution is local, and limited to districts where high and precipitous rocks abound, finds a congenial retreat in the precipices of St Abb's Head and adjoining coast : here it is not uncommon, but being a bird of wary habit, it is very difficult to approach within gunshot, and specimens are not easily obtained. Of the Scansorial tribe, the *Picus major* (great spotted woodpecker) is the only species belonging to the *Picidæ* that we venture to insert in the list, having at different times met with a few individuals, during the period of their migrations, within the limits of the Club, viz., one at Haggerstone, and two or three at Twizell. The wry-neck (*Yunx torquilla*) and hoopoe (*Upupa Epops*), belonging to the same tribe, are only admitted as very rare visitants, one of the former having been killed at Twizell, and two or three specimens of the latter within our limits. In the numbers of the cuckoo or gowk (*Cuculus canorus*) which visit us annually, we think we perceive a great decrease within the last twenty years ; this we also attribute to the advance of agriculture and to the inclosure of those wastes and open lands which, in a natural state, produced a more abundant supply of caterpillars, the favourite food of the cuckoo, than they now do under the system of husbandry to which they are subjected.

Of the *Columbidæ* belonging to the Rasorial order, we possess two permanent residents, viz.; the ring-dove or cushat (*Columba palumbus*),

* Rose-pastor, killed at Tweedmouth and Ladythorn.

a most abundant species; but from the injury it commits on the young clovers and the turnip-fields, is held as an enemy, and proscribed by the farmer; the other is the rock-pigeon, the original stock of our dovecot pigeons, which inhabits the cavernous precipices along the coast. As an occasional visitant we are also able to add the turtle-dove to the list, a small flock having visited the neighbourhood of Berwick this last autumn.

Of the Phasianidæ, the only member is a permanent resident; and of the Tetraonidæ three are permanent residents, and one the quail, which we have met with at Cornhill and other parts within our limits, an occasional visitant.

Of the Otidæ, or bustard family, we have ventured to insert the *Otis tetrax* (little bustard), a single specimen having been killed within half a mile of Twizell.

Of the Ardeadæ, or heron group, belonging to the order Grallatores, we reckon three species; one a permanent resident, the other two, viz., the bittern (*Botaurus stellaris*) and the night heron (*Nycticorax europæus*), rare visitants. A fine specimen of the latter was killed some years ago at the Hirsel, and presented to the Edinburgh museum by the Earl of Home.

Of the Scolopaceous family, there are two permanent residents, one periodical summer visitant, seven periodical winter visitants and seven occasional visitants. Among the latter we may mention as rare, the green sandpiper (*Totanus ochropus*), the greenshank (*Totanus glottis*), the solitary snipe (*Scolopax major*), the ruff (*Machetis pugnax*) in its winter plumage, and generally young birds of the year, and the grey phalarope (*Phalaropus lobatus*); the only summer visitant of the family is the *Totanus hypoleucos* (common sandpiper), a neat clean-looking bird, well known to the angler, and whose wing-feathers often assist him in taking his finny prey.

Of the Rallidæ there are five members, three of which are periodical summer visitants, one a permanent resident, and one a periodical winter visitant. To the first belongs the Cornerake, whose well known grating call is first heard towards the end of May, in the meadowlands, particularly those adjoining the margins of the Tweed, the Whitadder, and other streams. Of the Plovers, or family Charadriadæ, there are three permanent residents, one periodical summer visitant, the well known green plover or pewit, *Vanellus cristatus*; three periodical winter visitants, all of which are shore birds; and one occasional visitant, the dottrel, *Charadrius morinellus*, which rests for a few days upon the grounds around Scremerston and Unthank, in April or beginning of May, when passing to its breeding stations in higher latitudes.

Entering upon the order Natatores, we enumerate as members of the Anatidæ three permanent residents, one periodical summer visitant, the beautiful piebald sheldrake, which breeds annually in the rabbit-holes upon the links at Holy Island and Ross ; seven periodical winter visitants, and seven occasional visitants. Amongst the latter are the two species of wild swan (*Cygnus ferus*, and *C. Bewickii*), the bernicle or clake-geese (*Bernicla leucopsis*), which I have received from Holy Island ; also that very rare bird the *Anser ruficollis*, a specimen having been shot near Berwick several years ago, which found its way into Bullock's museum, and from thence, we believe, into that of St Petersburg. The Shoveller (*Spathulea clypeata*) has also been killed upon the Tweed.

Of the true divers or Colymbidæ, the list contains eight members ; one of which, the little grebe or dabchick (*Podiceps minor*), though not numerous, is a permanent resident. Six are periodical winter visitants, four of which belong to the genus *Podiceps*, the other two are the great northern and red-throated divers (*Colymbus glacialis* and *C. septentrionalis*), both of which frequent the mouth of the Tweed and Berwick Bay during the winter and early spring months ; the eighth member is the *Colymbus arcticus*, black-throated diver, a rare visitant. A fine specimen, caught in a salmon-net in the Tweed, is now in my possession.

Of the Auk family, Alcadeæ, there are three periodical summer visitants, all of which breed in great numbers in the precipitous cliffs of St Abb's Head ; and two occasional winter visitants, viz., the *Uria grylle*, black gullemot, and the *Mergulus alce*, roach, a species that breeds in very high latitudes, and is frequently mentioned in the writings of arctic navigators.

The Pelicanidæ are three in number, two of which, the common cormorant (*Phalacrocorax carbo*), and the crested shag, (*P. cristatus*), are permanent residents ; the *Sula bassana*, solan goose, we may consider as a periodical summer visitant, as it is to be seen almost daily skimming along the surface of the water, or precipitating itself upon its prey within our limits, on its flight to and from the isle of Bass, its great breeding station on the eastern coast.

Of the Laridæ, or Gull family, there appears to be only one we can properly designate a permanent resident, viz. the *Larus ridibundus*, black-headed gull. Within our district this species has several breeding stations, the principal of which are the pieces of water at Pallinsburn, Paston, and Dunse Castle. Six species appear as periodical summer visitants, four of which belong to the Terns, a genus distinguished from the gulls by their swallow-like form and a more rapid and powerful flight ; the other two are the herring-gull (*Larus argentatus*), and lesser black-backed gull (*L. fuscus*), the first breeding

in great numbers in the sea-cliffs. There is also one periodical winter visitant, the common gull (*L. canus*), and five occasional visitants, among which are the two large white-winged gulls (*L. glaucus* and *L. islandicus*), and the *Lestris Richardsoni*, arctic skua, better known, perhaps, by the name of the dung teazer.

RAPTORES.

Falconidæ.

<i>Haliaëtus albipectus</i> . White-tailed Sea Eagle. Specimens killed on the coast, and at Holy Island.	Occas. visit.
<i>Pandion Haliaëtus</i> . Osprey.	Occas. visit.
<i>Accipiter fringillarius</i> . Sparrow Hawk.	Perman. resid.
<i>Falco peregrinus</i> . Peregrine Falcon. An eyry at St Abb's Head.	Perman. resid.
<i>tinnunculus</i> . Kestrel.	Perman. resid.
<i>Æsalon</i> . Merlin. Not uncommon.	Perman. resid.
<i>Buteo vulgaris</i> . Common Buzzard. A specimen from Mellerstain.	Occas. visit.
<i>lagopus</i> . Rough legged Buzzard. Several killed last winter within the district.	Occas. visit.
<i>Pernis apivorus</i> . Honey buzzard. A specimen in my possession killed at Alnwick.	Occas. visit.
<i>cyaneus</i> . Hen Harrier.	Perman. resid.
<i>Circus æruginosus</i> . Moor Harrier. Now rare.	Perman. resid.
<i>cineraceus</i> . Ash-coloured Harrier. Very rare. A specimen in my possession, killed near Detchant.	Occas. visit.

Strigidæ.

<i>Otus vulgaris</i> . Long Eared Owl.	Perman. resid.
<i>brachyotus</i> . Short Eared Owl. Common during winter months, upon moors, in bushy fields, &c.	Period. W. vis.
<i>Strix flammea</i> . White or Barn Owl.	Perman. resid.
<i>Ulula stridula</i> . Tawny Owl. Now rare.	Perman. resid.

INSESSORES.

FISSIROSTRES.

Hirundinidæ.

<i>Hirundo rustica</i> . Chimney Swallow.	Period. S. visit.
<i>urbica</i> . Window Swallow or Martin.	Period. S. visit.
<i>riparia</i> . Bank Swallow or Sand Martin.	Period. S. visit.
<i>Cypselus murarius</i> . Swift.	Period. S. visit.

Caprimulgidæ.

Caprimulgus europæus. Common Goatsucker. Period. S. visit.

Haleyonidæ.

Alcedo Ispida. Kingfisher. Rare. Occas. visit.

DENTIROSTRES.

Muscicapidæ.

Muscicapa grisola. Spotted Flycatcher. Period. S. visit.
luctuosa. Pied Flycatcher. Rare. Occas. visit.

Laniadæ

Lanius excubitor. Great Butcher Bird or Shrike. Occas. W. visit.

Merulidæ.

Merula viscivora. Missel Thrush. Perman. resid.
pilaris. Fieldfare. Period W. vis.
Iliaca. Redwing. Period W. vis.
musica. Thrush. Perman. resid.
vulgaris. Blackbird. Perman. resid.
torquata. Ring Ouzel. Period. S. visit.
Cinclus aquaticus. Dipper, Water Crow. Perman. resid.

Sylviadæ.

Saxicola Oenanthe. Wheatear. Period. S. visit.
rubecola. Stonechat. Perman. resid.
rubetra. Whinchat. Period. S. visit.
Erythaca rubecula. Redbreast. Perman. resid.
Phoenicurea ruticilla. Redstart. Not common. Period. S. visit.
Salicaria locustella. Grasshopper Warbler. Period. S. visit.
Phragmitis. Sedge Warbler. Period. S. visit.
Curruca atricapilla. Blackcap. Period. S. visit.
hortensis. Greater Pettychaps. Period. S. visit.
Curruca cinerea. Whitethroat. Period. S. visit.
Sylvia hippolais. Lesser Willow Wren. Not
common. Period. S. visit.
sibilatrix. Wood Wren. Period. S. visit.
trochilus. Willow Wren. Plentiful. Period. S. visit.
Regulus auricapillus. Golden Crested Regulus. Perman. resid.

<i>Parus major</i>	Great Titmouse.	Perman. resid.
<i>cœruleus</i> .	Blue Titmouse.	Perman. resid.
<i>palustris</i> .	Marsh Titmouse.	Perman. resid.
<i>ater</i> .	Cole Titmouse.	Perman. resid.
<i>caudatus</i> .	Long-tailed Titmouse.	Perman. resid.
<i>Accentor modularis</i> .	Hedge Accentor.	Perman. resid.
<i>Motacilla Yarrellii</i> .	Pied Wagtail	Period. S. visit.
<i>boarula</i> .	Grey Wagtail.	Period. S. visit.
<i>flava</i> .	Yellow Wagtail.	Period. S. visit.
<i>Anthus petrosus</i> .	Rock Pipit.	Perman. resid.
<i>pratensis</i> .	Common Pipit.	Perman. resid.
<i>arboreus</i> .	Tree Pipit.	Period. S. visit.

Ampelidæ.

<i>Bombycilla garrula</i> .	Chatterer, or Bohemian Waxwing.	Occas. visit.
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Fringillidæ.

<i>Alauda arvensis</i> .	Skylark.	Perman. resid.
<i>arborea</i> .	Woodlark. A specimen taken at Twizell.	Occas. visit.
<i>Plectrophanes nivalis</i> .	Snowflake.	Period. W. vis.
<i>Emberiza miliaria</i> .	Corn Bunting.	Period. resid.
<i>citrinella</i> .	Yellow Bunting.	Perman. resid.
<i>schœnielus</i> .	Reed Bunting.	Perman. resid.
<i>Pyrgita domestica</i> .	Common Sparrow.	Perman. resid.
<i>Fringilla cœlebs</i> .	Chaffinch.	Perman. resid.
<i>montifringilla</i> .	Mountain Finch.	Period. W. vis.
<i>Carduelis spinus</i> .	Siskin.	Occas. W. visit.
<i>elegans</i> .	Goldfinch.	Occas. visit.
<i>Linaria cannabina</i> .	Grey Linnet.	Perman. resid.
<i>minor</i> .	Lesser Redpoll Linnet.	Period. S. visit.
<i>Coccothraustes chloris</i> .		Perman. resid.
<i>Loxia curvirostris</i> .	Crossbill.	Occas. visit.
<i>Pyrrhula vulgaris</i> .	Bullfinch.	Perman. resid.

Sturnidæ.

<i>Sturnus vulgaris</i> .	Common Starling.	Perman. resid.
<i>Pastor roseus</i> .	Rose-coloured Pastor.	Occas. visit.

Corvidæ.

<i>Corvus Corax</i> .	Raven.	Perman. resid.
<i>Corvus Corone</i> .	Carriion Crow.	Perman. resid.
<i>cornix</i> .	Hooded Crow.	Period. W. vis.
<i>frugilegus</i> .	Rook.	Perman. resid.
<i>monedula</i> .	Jackdaw.	Perman. resid.

<i>Pica melanoleuca.</i>	Magpie.	Perman. resid.
<i>Garulus glandarius.</i>	Jay.	Perman. resid.
<i>Fregilus graculus.</i>	Chough.	Perman. resid.

SCANSORES.

Picidæ.

<i>Picus major.</i>	Great spotted Woodpecker.	Occas. visit.
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Certhiadæ.

<i>Yunx torquilla.</i>	Wryneck.	Once near Twizell.	Occas. visit.
<i>Certhia familiaris.</i>	Creeper.		Perman. resid.
<i>Troglodytes Europæus.</i>	Common Wren.		Perman. resid.
<i>Upupa Epops.</i>	Hoopoe.		Occas. visit.

Cucullidæ.

<i>Cuculus canorus.</i>	Cuckoo.	Period. S. visit.
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RASORES.

Columbidæ.

Columba palumbus.	Ringdove.	Perman. resid.
livia.	Rock Pigeon.	Perman. resid.
Turtur vulgaris.	Turtle Dove.	Occas. visit.

Phasianidæ.

<i>Phasianus Colchicus.</i>	Common Pheasant.	Perman. resid.
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Tetraonidæ.

Tetrao Tetrix.	Black Grouse.	Perman. resid.
Lagopus Scoticus.	Red Grouse.	Perman. resid.
Perdix cinerea.	Partridge.	Perman. resid.
coturnix.	Quail.	Occas. visit.

Otidæ.

<i>Otis Tetrax.</i>	Little Bustard.	Once near Twizell.	Occas. visit.
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GRALLATORES.

Ardeadæ.

Ardea cinerea.	Common Heron.	Perman. resid.		
Botaurus stellaris.	Bittern.	Now rare.	Occas. visit.	
Nycticorax Europæus.	Night Heron.	Rare.	A fine specimen killed at the Hirscl.	Occas. visit.

Scolopacidæ.

Numenius arquatus.	Common Curlew.	Perman. resid.
phæopus.	Whimbrel. Not common.	Occas. visit.
Totanus calidris.	Redshank Sandpiper.	Period. W. vis.
ochropus.	Green Sandpiper. Rare.	Occ. vis. in. Aut.
hypoleucos.	Common Sandpiper.	Period. S. visit.
glottis.	Greenshank Rare. A specimen killed at Holy Island, October 1840.	Occ. vis. in Aut.
Limosa rufa.	Common Godwit.	Period. W. vis.
melanura.	Black-tailed Godwit. Rare.	Occas. W. vis.
Scolopax major.	Great Snipe. Rare.	Occ. vis. in Aut.
Gallinago.	Common Snipe.	Perman. resid.
Gallinula.	Jack Snipe.	Period. W. vis.
rusticola.	Woodcock.	Period. W. vis.
Machetes pugnax.	Ruff. Fenham Slake.	Occ. vis. in Aut.
Tringa canutus.	Knot.	Period. W. vis.
maritima.	Purple or rock Tringa.	Period. W. vis.
variabilis.	Dunlin or Purre.	Period. W. vis.
Phalaropus lobatus.	Grey Phalarope. Very rare.	Occas. W. vis.

Rallidæ.

Rallus aquaticus.	Common Rail.	Period. W. vis.
Crex pratensis.	Meadow Crake.	Period. S. visit.
porzana.	Spotted Crake. Not common.	Period. S. visit.
Gallinula chloropus.	Common Gallinule.	Perman. resid.
Fulica atra.	Common Coot.	Period. S. visit.

Charadriadæ.

Hæmatopus ostralegus.	Oystercatcher or Seapie.	Perman. resid.
Streptilas interpres.	Turnstone.	Period. W. vis.
Arenaria calidris.	Sanderling.	Period. W. vis.
Vanellus cristatus.	Lapwing.	Period. S. visit.
Squaterola cinerea.	Grey Plover.	Period. W. vis.
Charadrius pluvialis.	Golden Plover.	Perman. resid.
morinellus.	Dottrel. At Unthank and Scremerston, in May.	Period. occ. vis.
hiaticula.	Ring Dottrel.	Period. visit.

NATATOIRES.

Anatidæ.

Anser palustris.	Grey Lag-goose.	W. visit.
Anser segetum or ferus.	Bean-goose.	Period. W. vis.

<i>Anser albifrons.</i>	White-footed Wildgoose.	Occas. W. visit.
<i>Bernicla.</i>	Bernicle or Clake Goose.	Occas. W. visit.
<i>Brenta.</i>	Brent Bernicle.	Period. W. vis.
<i>ruficollis.</i>	Red-breasted Goose. Very rare. A single specimen shot near Ber- wick, afterwards in Bullock's Museum.	Occas. W. visit.
<i>Cygnus ferus.</i>	Whistling Swan or Elk.	Occas. W. visit.
	<i>Bewickii.</i> Bewick's Swan.	Occas. W. visit.
<i>Tadorna vulpanser.</i>	Common Sheldrake.	Period. S. visit.
<i>Spatulea clypeata.</i>	Shoveller. Rare upon the Tweed.	Occas. visit.
<i>Anas Boschas.</i>	Wildduck.	Perman. resid.
<i>Dafila caudacuta.</i>	Pintail. Rare. Tweed & Holy Island.	Occas. W. vis.
<i>Querquedula crecca.</i>	Teal.	Perman. resid.
<i>Mareca Penelope.</i>	Wigeon.	Period. W. vis.
<i>Oidemia nigra.</i>	Black Scoter.	Period. W. vis.
	<i>fusca.</i> Velvet Scoter.	Period. W. vis.
<i>Somateria mollissima.</i>	Eider Duck.	Perman. resid.
<i>Fuligula ferina.</i>	Red-headed Pochard.	Occas. W. vis.
	<i>cristata.</i> Crested Pochard.	Period. W. vis.
<i>Harelda glacialis.</i>	Long-tailed Hareld.	Period. W. vis.
<i>Clangula vulgaris.</i>	Common Golden-eye Garrot.	Period. W. vis.
<i>Mergus merganser.</i>	Gooseander.	Occas. W. visit.
	<i>serrator.</i> Red-breasted Merganser.	Period. W. vis.
	<i>albellus.</i> Smew. Rare.	W. visit.

Colymbidæ.

<i>Podiceps rubricollis.</i>	Red-necked Grebe. Rare.	W. visit.
	<i>cristatus.</i> Crested Grebe. In the young state.	W. visit.
	<i>cornutus.</i> Horned Grebe. In the young state.	W. visit.
	<i>auritus.</i> Eared Grebe. In the young state.	W. visit.
	<i>minor.</i> Little Grebe.	Perman. resid.
<i>Colymbus glacialis.</i>	Northern Diver.	Period. W. vis.
	<i>arcticus.</i> Black-throated Diver. Rare.	
	Caught in a salmon-net in the Tweed.	Occas. W. visit.
	<i>septentrionalis.</i> Red-throated Diver.	Period. W. vis.

Alcadæ.

<i>Uria Troile.</i>	Foolish Gullimot. Rocks of St Abbs.	Period. S. visit.
	<i>Grylle.</i> Black Guillemot. In winter plumage.	Occas. W. visit.
<i>Mergulus melanoleucos.</i>	Common Rotch. Rare.	Occas. W. visit.
<i>Alca Torda.</i>	Razorbill. Rocks St Abbs.	Period. S. visit.
<i>Fratercula arctica.</i>	Puffin.	Period. S. visit.

Pelecanidæ.

Phalacrocorax carbo.	Cormorant.	Perman. resid.
	cristatus. Crested Cormorant.	Perman. resid.
Sula bassana.	Solan Goose.	Period. S. visit.

Laridæ.

Sterna Boysii.	Sandwich Tern. On coast.	S. visit.
	Dougallii. Roseate Tern. On coast occasionally.	S. visit.
	arctica. Arctic Tern. On coast occasionally.	S. visit.
	minuta. Little Tern. Breeds near Holy Island.	S. visit.
Larus minutus.	Little Gull. Very rare. A specimen killed at Holy Island, Oct. 1840.	Rare occas. vis.
	ridibundus. Black-headed Gull.	Perman. resid.
	canus. Common Gull.	W. visit.
	glaucus. Glaucous Gull. Rare.	Occas. W. vis.
	islandicus. Iceland Gull. Rare.	Occas. W. vis.
	argentatus. Herring Gull. St. Abb's Head.	S. visit.
	fuscus. Lesser Black-backed Gull.	S. visit.
Lestris parasiticus.	Arctic Skua. Autumnal visitant.	Occas. visit.
Thalassidroma pelagica.	Stormy Petrel.	Occas. visit.

Members Admitted 15th September 1841 :—

Mr ROWE, Surgeon, Coldstream.

Mr JOHN BOYD of Cherrytrees.

*A Descriptive Catalogue of the GASTEROPODOUS MOLLUSCA
of Berwickshire.* By GEORGE JOHNSTON, M.D., F.R.C.S.E.

PART II.

ORDER—PECTINIBRANCHIATA.

DIVISION—ASIPHONOBANCHIATA.

Animal shelled, trachelipode, rarely gasteropode; the *shell* spiral, sometimes patelliform, with the margin of the aperture entire or continuous all round.—The genera are diœcious, in general phytophagous, and, with a few exceptions, inhabitants of the sea-shore.

7. SCALARIA. LAMARCK.

Shell turreted, the whorls crossed with elevated subacute ribs; aperture round, the margin continuous and reflected, the lower part on the side of the pillar formed into a sort of obsolete canal; operculum horny, spiral.—*Zoophagous*.

1. *S. Trevelyana*, shell yellowish-brown or white, with ten rounded whorls gradually tapered to a point, crossed by about fifteen thick plain ribs, interrupted by a separating line, the intermediate spaces smooth; aperture white, round. Height $\frac{8}{10}$ ths; diameter of base $\frac{3}{10}$ ths. *Leach* in *Raine's Durham*, p. 174.

Hab. Berwick Bay, rare: Holy Island.

I have seen only worn specimens, so that the natural colour remains to be determined. The shell is strong, and without any gloss in my specimens, and the ribs are obtuse and enlarged at the suture, where, instead of running in an uninterrupted line, they are a little bent, and fall into the intermediate spaces. The species is very like, and nearly allied to *Sc. Turtoni*, but differs from it in being smaller, and in having more numerous ribs.

8. TROCHUS. LINNÆUS.

Shell conical, the body-whorl angulated so as to make a flattened base, on which the shell rests when set on a plane surface; aperture transversely depressed, subquadrate, the margins disjoined, silvered interiorly; pillar arched: "operculum horny, circular, spiral, with numerous close-set volutions, and having the spiral line external."—*Sowerby*.

* *Base imperforate.*

1. *T. zizyphinus*, shell conical, yellowish-brown or flesh-colour, spirally ridged, the ridges flat and smooth; whorls eight, flat,

separated by a smooth belt regularly spotted with pink; apex acute, purple; base circularly striate, flattish; aperture subquadrangular, the pillar concave, pearly. Height $\frac{1}{10}$ ths; the breadth $\frac{1}{10}$ ths. *Dillw. Rec. Sh.* 799.

Hab. Berwick Bay, not common.

The shell is sometimes of a uniform white colour, when it has been described as a distinct species under the name of "*Trochus Lyonsii*;" and besides this there are in our Bay two varieties; in one the whorls are slightly concave, and the base is covered with the circular impressed striæ; in the other the whorls are even, and there are only two or three striæ at the pillar, and two near the margin, leaving the intermediate space perfectly smooth. Operculum thin, round, and circularly striate.

Snail of a more or less deep brown colour, which is often disposed in patches or irregular streaks, covered with small tubercles, and furnished on each side with four slender retractile filaments, originating from a free membranous border that garnishes the sides, the back concave and smooth: mouth shortly probosciform, furnished with two small corneous jaws: tongue long, linear, armed as usual with minute prickles arranged in regular series: tentacula setaceous, pale, quadrangular, with a dusky line along the upper angles, and rough with minute papillæ when viewed through a good magnifier: eyes on distinct pedicles at the external bases of the tentacula: margin of the collar crenate or sinuate: foot oblong, tapered posteriorly, the margin crenulate, the disk straw-yellow, more or less tinted with red or flesh-colour. The edges of the foot can be brought together so as entirely to conceal its disk.

** *Base umbilicate.*

2. *Tr. cinerarius*, shell conical, obtuse, yellowish or bluish-grey, with numerous narrow purplish stripes; whorls six, flat, spirally striate; the base flattish and the umbilicus deep; aperture white, perlaceous, subquadrangular. Diam. of base $\frac{1}{10}$ or $\frac{1}{10}$ ths; height the same. *Dillw. Rec. Sh.* 779.

Hab. Between tide marks, very common.

The spire is more or less raised, the suture more or less distinct, the base in some more deeply striated than in others, and the umbilicus in young shells wider than in the old, in which it is almost obliterated; but among these varieties there are none with characters sufficiently marked to justify their elevation to the rank of species. Operculum circular, horny, thin, concentrically striate, with a membranous border.

The body and tentacula of the snail are finely marked with black transverse lines, which become reticulated on the sides: tentacula two, slender, setaceous: eyes on distinct footstalks at the external base of the tentacula: mouth striated with black lines, armed with a pair of oblong pointed cartilaginous jaws, and a ribbon-like tongue roughened with acute prickles set in transverse curved lines: sides of the body furnished with a ciliated membrane, underneath which protrude several long tentacular filaments, which issue from tubular sheaths, and are retractile: foot elliptical, yellowish, the margin fringed with very short fleshy filaments, visible only with a magnifier. Our children call the shell *Silver-buckies* or *Silver-Willies*; they do not eat the snail.

During the summer we often find a spawn on the fronds of sea-weed deposited in the form of a small ring, and of a cream colour. I believe this to be the spawn of *Tr. cinerarius*. The ring is gelatinous, firmly adherent, and contains innumerable ova, each separately laid in the centre of its own gelatinous vesicle.

3. *T. tumidus*, shell conical, obtuse, greyish-white mottled with darker spots or lines, spirally striated; whorls six, flattened on the upper margins, the superior minute; base convex; umbilicus small; aperture roundish. Diam. $\frac{3}{10}$ ths; height $\frac{4}{10}$ ths. *Flem.* Brit. Anim. 322. *Tr. patholatus*, *Dillw. Rec. Sh.* 776.

Hab. Berwick Bay, rare.

4. *T. Margarita*, shell depressed, subglobular, flesh-red and clouded, iridescent, smooth; spire lateral, of four whorls, the apex obtuse; base rounded; umbilicus small; aperture round, perlaceous. Diam. $\frac{1}{8}$ th. *Gray*, in *Zool. Journ.* ii. 567. *Helix Margarita*, *Laskey*, in *Wern. Mem.* i. 408. tab. 8. fig. 5. *Turbo Margarita*, *Lowe*, in *Zool. Journ.* ii. 107. tab. 5. fig. 10, 11. *Flem. B. Anim.* 299.

Hab. On the fronds of sea-weed, not uncommon.

This pretty shell is glossy, and in some lights reflects metallic colours: it is smooth, or only marked with the striae of growth, but the base has some faint impressed spiral striae. Tentacula two, slender, white, setaceous, with the eyes on a pedicle at their external base: foot ovate with plain margins; sides furnished with tentacular filaments, four on each side: margin of the cloak between the tentacula rounded and beautifully crenulate. When the animal is in motion the shell is placed laterally.

The snail is active and quick in its progression, moving by very evident undulations of the foot. It adheres to smooth surfaces less tenaciously than most snails do, and is easily shook from its hold; nor does it seem to be so readily alarmed. When in confinement, it rarely leaves the water entirely; and it swims in a reversed position, but seldom, and with much less than its usual freedom. It lives naturally at low water-mark, and is usually found among the roots or on the frond of *Laminaria digitata*, or perhaps still oftener on the dulse (*Rhodomenia palmata*), which is probably a favourite food.

9. NATICA. ADANSON.

Shell globose, smooth, the body-whorl very large, and the spire small; aperture lunated, the pillar-lip oblique, toothless, with a callus more or less concealing the umbilicus; outer lip acute, plain; operculum horny.—*Zoopagous*.

1. *N. monilifera*, shell subglobular, smooth, greyish tinged with brown, and a row of brown waved stripes along the tops of the whorls; whorls six, the body very large, obscurely angled on the shoulder; spire somewhat produced, oblique; umbilicus deep, open, obscurely striate. Length $1\frac{1}{10}$ ths; breadth 1 inch. *Lam. Anim. s. Vert.* vi. ii. 200. *N. glaucina*, *Flem. Br. Anim.* 319. *Nerita glaucina*, *Pen. Brit. Zool.* iv. 344. tab. 90. fig. 1.

Hab. Ross sands.

The waved oblong spots which run up the shell at the base of the sutures are concealed or obscured in recent specimens by the thin glaucous epidermoid covering. The umbilicus is not contracted by a deposition of callus,

and is spirally striated; pillar white, thickened; outer lip thin, even, with a brownish margin; throat brown. Operculum horny, thin, ear-shaped, turned spirally at the inferior and inner margin, whence fine striæ diverge to the circumference.

The animal buries in sand at the very lowest recess of the tide, and is discovered by the little hillocks which it raises above the shell. Dr Gould, in his valuable and elaborate "Report on the Invertebrate Animals of Massachusetts," p. 232, asserts that the *Naticæ* are all very voracious, and play a conspicuous part in devouring the dead fish and other animals which are thrown up by the tide. The small circular holes with which bivalve shells are often drilled are also, according to Dr Gould, the work of these snails, and made by them to gain an entrance to the animal apparently so well secured against such a foe. Their foot is very large, so as completely to envelope the objects on which they prey.

2. *N. Alderi*, shell subglobular, smooth, flesh-coloured with a white zone at the sutures and base, the body with five rows of arrow-shaped brown spots, one continued round the base of the lesser whorls; spire small, slightly produced; umbilicus partly covered by callus and brown. Length $\frac{1}{10}$ ths; breadth about $\frac{1}{30}$ ths. *Forbes*, Faun. Mon. 31. *Nèrita glaucina*, var. *B. Turt. Conch. Dict.* 125. *Hogg*, in *Lin. Trans.* xiv. 320. tab. 9. fig. 3-8.

Hab. Berwick Bay, occasionally found in the refuse of fishing-boats.

Operculum semilunate, horny, with a narrow membranous edge. The white band on the shoulder of the body-whorl, under the suture, is occasionally obscure or obsolete. A brown, narrow fascia always enters within the umbilicus, and the callus, on the pillar above it, is more or less tinted with the same colour.

3. *N. helicoides*, shell ovato-conical, smooth, white, immaculate, coated with a yellowish epidermis; whorls five, rounded, separated by a channelled suture; the spire produced, rather obtuse; aperture pure white with a small fissure on the pillar. Length $\frac{1}{10}$ ths; breadth scarcely $\frac{1}{10}$ ths. *Lyell* in *Phil. Mag.* for May 1840, p. 365, fig. 12.

Hab. Berwick Bay, very rare.

This new species was found in the refuse of one of our fishing-boats. When the epidermis is removed, the whorls appear to be very finely striolate in a spiral direction.

This shell, which departs from the normal form of the genus, Mr Lyell finds, in a fossil state, in the "Norwich crag," when it appears to have been much more abundant than in our present sea. Mr Lyell has given an excellent figure of it, which will correct the faults of our own. In habit the species is closely allied to the *Natica canaliculata* of Gould. See his Report, p. 235, fig. 161.

I found, some time since, among the refuse of a fishing boat, a specimen of a *Natica* which appears to be identical with the *NATICA GLAUCINOIDES* of my friend Dr Thomas Thomson (*Rec. Gen. Science*, i, p. 133.) and which Mr Alder tells me is certainly the *NAT. CLAUSA* described by Mr Smith as a fossil found in the pliocene deposits of the British islands. I cannot, however, affirm that the species still lives in our Bay, for the shell was dead, and presented the same appearance as the subfossil specimens.

10. TURRITELLA. LAMARCK.

Shell turreted, tapered, with numerous whorls, the last not much larger than the penultimate; aperture round, the margin disjoined on the body-whorl, thin; operculum circular, horny.—*Zoophagous*.

1. *T. terebra*, shell white or pale brown, spirally ridged with fine decussated striæ in the interstices; whorls from twelve to sixteen, rounded, tapered to a point; aperture round, the outer lip very thin. Length $1\frac{1}{2}$ inch; breadth $\frac{4}{10}$ ths. *Flem. Br. Anim.* 302. Turbo terebra, *Linn.*—*Penn. Brit. Zool.* iv. 308, tab. 84, fig. 4.

Hab. Berwick Bay, in deep water.

11. LITTORINA. FERUSSAC.

Shell oval, rarely subglobular, thick, the body-whorl occupying at least one-half of the length, non-umbilicate; aperture roundish, the margin sharp-edged, disjoined on the body; pillar flattened; operculum horny, with few volutions increasing rapidly in width, its nucleus lateral.

1. *L. littorea*, shell ovate-acute, thick, spirally striated, greyish with numerous brown spiral lines; whorls six, nearly even, the superior small and ill defined; pillar white, the throat brown. Length $1\frac{4}{10}$ ths; breadth $\frac{8}{10}$ ths. Turbo littoreus, *Lin.*—*Dillw. Rec. Sh.* 817. *Flem. Br. Anim.* 298.

Hab. Berwick Bay, very common between tide marks.

In our bay *L. littorea* is subject to very little variety, but it occasionally occurs of uniform hyacinth-red colour. The outer lip before maturity is thin, and marked with dark scores, but it ultimately grows thicker and white. The operculum is horny, ovate, pointed above, darker coloured and spirally twisted near the centre, the margin thin membranous.

The animal is beautifully marked with black spots and lines disposed transversely, and forming a sort of network on the sides. Mouth shortly proboscoidiform, furnished with a pair of triangular thick subcorneous jaws and a narrow ribbon-like tongue rolled up spirally, and when extended upwards of an inch long: it is marked across with numerous denticulated striæ, and has a broad membrane at the base. Tentacula two, dorsal, tapered, somewhat compressed, contractile, spotted: eyes small, inserted into an indenture near their dilated bases: cloak with a plain continuous pale-yellow margin: branchiæ in a single long pectinate process adnate to the left side: rectum on the opposite side, large, with a prominent narrow orifice. Sexes separate; the penis of the male originating under the right tentaculum, large, tapering from a broad base to a point, a little compressed, retroflected. Foot white, oval, short, with plain margins. I have seen a specimen in which the tentacula were divided into two branches.

The snail, when washed and boiled, is eaten by children, and sometimes by the common people. Of late years great numbers have been exported from our coasts to the London market, where they find a ready sale:—

“The periwinkle, prawn, the cockle and the shrimp,
For wanton women’s taste or for weak stomachs bought!”

DRAYTON.

2. *L. rudis*, shell ovate, ventricose, obscurely striated in a spiral direction; whorls five, rounded, well defined by the suture; pillar and margin of the lip whitish, the throat brown or purple. Length $\frac{1}{10}$ ths, breadth $\frac{5}{10}$ ths. *Turbo rudis*, *Flem. Br. Anim.* 298.

Var. a. Shell of a uniform pale dusky yellow, the spiral striæ impressed. *Turbo rudis*, *Mont. Test. Brit.* 304. *Maton* and *Racket*, in *Lin. Trans.* viii. 159, tab. 4, fig. 12, 13. *Lam. Anim. s. Vert.* vii. 49.

Var. b. Shell a uniform flesh-red, the spiral striæ often raised. *Turbo rudissimus*.

Var. c. Shell a uniform purplish red, the spiral striæ raised into sharp ridges. *Turbo jugosus*, *Mont. Test. Brit.* p. 586.

Var. d. Shell white or with two dusky bands, the spiral striæ elevated into ridges. *T. jugosus*, var. *Mont. loc. cit.*

Hab. On rocks at high-water mark or above it, abundant.

This never attains one half the size of the preceding, and is certainly a very distinct species, clustering in myriads in crevices of rocks at or above the highest tides, and very rarely descending to the zone of the common wrack (*Fucus vesiculosus*), which is the favourite walk of *L. littorea*. All the varieties are to be found intermixed, but many excellent naturalists consider those on which the striæ rise into ridges as distinct from the smoother kind, an opinion which I do not adopt, believing that this character may be dependent partly on age and partly on differences in the external influences to which they have been exposed. The animal is not streaked and spotted, but of a uniform colour with a dusky line along the outer side of the tentacula; and it is, as Mr Boys first stated, viviparous, the females carrying their innumerable young, immersed in a cluster of jelly and arranged in transverse rows, within the branchial cavity, where they may be found at all seasons. The penis of the male is very large, retroflected, linear-oblong, compressed, serrulate on the outer side. Copulates in November; and very small individuals may be found in sexual union at this period of the year.

3. *L. saxatilis*, shell subglobose with a small raised spire, regularly chequered with square spots on a white or yellow ground, spirally striate or grooved; whorls four, rounded, the body very large; aperture dark purple with a pale margin. Diam. 2 lines. *Bean*.

Hab. On rocks near low-water mark, which are bare of weed but covered with Balani.

Captain Brown, in his *Illustrations of Conchology*, has given, in plate 46, two figures, No. 7, 8, of a variety of *Turbo littoreus*, which seem to have been drawn from specimens of this species, but of a much larger size than any I have seen. If a variety, it certainly does not belong to the *L. littorea* but to *L. rudis*, with which it is found occasionally intermixed; but Mr Bean and Mr Alder, both very experienced conchologists, consider it distinct. The latter remarks:—"It is not uncommon on rocks between high and low water mark, and in (what I take it to be) its full grown state, has the margin of the aperture nearly continuous, with a slight depression behind it. There is a black variety of it which is very similar to *T. tenebrosus*; but the latter species, so far as I know, is never found on rocks, but always in muddy estuaries."

4. *L. petraea*, shell conical, the body ventricose and larger than the pointed spire, glossy-black, smooth; whorls five, almost even; aperture roundish, uniform dark glossy purple, the lip thin, the pillar rounded below, flat, and brought to an edge. Length $\frac{1}{10}$ ths; breadth $\frac{1}{10}$ ths. Turbo petraeus, *Dillw. Rec. Sh.* 820. Helix petraea, *Mont. Test. Brit.* 403.

Hab. On rocks at high water mark, not common.

The colour of the shell is frequently obscured with extraneous matter, but its total want of spiral striae suffices to distinguish it from all the preceding, were the other characters less discriminative than they really are, for this is a very distinct species. The base of the body-whorl is often white. Snail black with setaceous white tentacula, the eyes at their swollen bases; mouth proboscideiform, and, during its progress in water, the animal is continually protruding and retracting the tongue; foot short, broad, plain, very obtuse behind, pellucid white with a milk-white band across the front.

5. *L. neritoides*, shell subglobular, variously coloured, smooth or very faintly striated; whorls five, those of the spire small and depressed; throat of the aperture brown, the pillar pale. Length $\frac{1}{10}$ ths; breadth $\frac{1}{10}$ ths. *Forbes, Faun. Mon.* 19. Nerita littoralis, *Penn. Brit. Zool.* iv. 346, tab. 90. fig. 3. *Dillw. Rec. Sh.* 989. Turbo retusus et neritoides, *Lam. Anim. s. Vert.* vii. 48.

Hab. Berwick Bay, between tide marks, common.

The colour of the shell is commonly yellowish-brown, olive, or yellow, plain or banded, but many specimens are purplish-brown and prettily tessellated. These are reckoned by some to be a distinct species. The animal is essentially the same with *L. littorea*, but of a yellowish colour and unspotted, excepting a few minute specks on the sides and under the right tentaculum. Penis with a longish suddenly acuminate point, and the outer side of the broad part is roughened with granulations arranged in three rows.

On the 26th of November 1835, which was a fine day for the season and rather warm, and which had been preceded by two or three weeks of wet stormy weather, I visited our shore, and found that the animals were very active, creeping about with the head and tentacula more than usually protruded. From their unusual activity, and a certain indescribable bustle about them, my curiosity was roused to a more attentive examination, and I soon ascertained that they were busied in the great work of procreating their race. Several pairs were detected in connection, the male resting on the shell of the female: the yellow were coupled indiscriminately with yellow or with the olive coloured, and sometimes a small immature one with one full grown and aged.

This species is oviparous, and the spawn is deposited in spring on sea-weeds, particularly on *Fucus vesiculosus* and *serratus*, in roundish gelatinous masses about half an inch in diameter, and studded over with the imbedded ova. These lie without any certain order in the common mass, but each has its own separate cell, of a sub-hexangular figure; and in the centre of the individual eggs, the young are perceptible, like in every respect to their parent.

6. *L. Ulvæ*, shell conical, rather thick, yellowish-brown, smooth; whorls seven, nearly flat; aperture ovate, reflected on the pillar forming a slight fissure at the base. Length $\frac{2}{3}$ ths. Turbo Ulvæ,

Penn. Brit. Zool. iv. 299, tab. 89, fig. 7. *Cingula Ulvæ*, *Flem.*
Brit. Anim. 308. *Paludina Ulvæ*, *Forbes*, *Faun. Mon.* 18.

Hab. Muddy inlets. Shore below Beal, browsing on the *Salicornia*. Holy Island. Near Warren Mill.

The lip is often reflected on the pillar as in some *Rissoæ*. Snail blackish; mouth proboscideiform, slightly bilobed; tentacula tapered with a dark ring at the tips, the eyes near the thickened base and external; foot rather short, rounded behind, truncate in front; pale with a yellowish tint, the margins plane. Can float at the surface in a reversed position.

12. LACUNA. TURTON.

Shell conoid or somewhat globular, thin; aperture roundish or oval, with the lips disjoined; pillar flattened, with a longitudinal groove terminating at the upper end in an umbilicus: operculum horny, thin.

1. *L. pallidula*, shell subglobular, ventricose, thin, subpellucid, yellowish horn colour; whorls four, the spire depressed with minute but well-defined whorls; aperture wide, lunate, the pillar white, and the umbilicus large. Diam. $\frac{1}{10}$ ths. *Turton* in *Zool. Journ.* iii. 190. *Nerita pallidula*, *Dillw. Rec. Sh.* 986.

Hab. Berwick Bay, on the leaves of *Fuci* near low-water mark, frequent. Animal yellowish, unspotted: tentacula two, setaceous, the eyes at their outer base, small, prominent: mouth shortly proboscideiform: foot oval, obtuse posteriorly, plain: operculum horny, lunate, spiral at the base.

2. *L. vineta*, shell ovato-conical, subpellucid, smooth, with six rounded whorls, the lower faintly striated and marked with four brown bands, two of which are continued up the spire; aperture suborbicular, the pillar rounded, with a narrow groove and perforation. Length $\frac{1}{10}$ ths, breadth $\frac{3}{10}$ ths. *Turton* in *Zool. Journ.* iii. 192. *Turbo vinetus*, *Mont. Test. Brit.* 307, tab. 29. fig. 3.

Hab. On the leaves of *Fuci* about low-water mark, common.

The following varieties have occurred in our bay:—

- (a) Shell thickish, the spire depressed, the body with only two narrow distant bands.
- (b) Shell with the spire depressed, and three bands of a pine red colour on the body, the middle one broad. These two varieties belong to the *L. quadrifasciata* of *Turton*, or *Turbo quadrifasciatus* of *Montagu*, *Test. Brit.* 328, tab. 20, fig. 7.
- (c) Shell of a very pale rose colour without bands.
- (d) Shell of a uniform yellowish-horn colour.

In all the body-whorl is obscurely angulated near the base, and at the suture, which is made more obvious by a whitish band winding up the spire. The snail is of a pale flesh colour, the proboscideiform mouth reddish-orange, the sides, and sometimes the head, dusky or black: tentacula setaceous, contractile, the eyes on short pedicles at their base: foot oval, rounded at both ends, widest behind, the anterior end capable of being extended considerably beyond the head, the margins plain, but there are two very short filaments between the hinder part and operculum. It swims on the surface in a reversed position, and it frequently leaves the water to settle on the surface of *fuci* exposed to the atmosphere.

3. *L. crassior*, shell conical, thickish, covered with a yellowish epidermis raised into numerous transverse plaits; whorls six, rounded, angulated at the suture and at the base of the body; aperture white, the pillar narrow, with a slight perforation. Length $\frac{3}{10}$ ths; breadth nearly $\frac{1}{10}$ ths. *Turton* in Zool. Journ. iii. 192. *Turbo crassior*, *Dillw. Rec. Sh.* 820. *Flem. Brit. Anim.* p. 299.

Hab. Berwick Bay, rare.

13. RISSOA. FREMINVILLE.

Shell conical or turreted, the body-whorl larger than the succeeding; aperture round or oval, the margin even, continued round the body-whorl; operculum horny.

1. *R. striata*, shell cylindraceous, obtusely pointed, light brown, with six rounded whorls strongly striated in a spiral direction; aperture suborbicular, pointed above. Length $\frac{1}{2}$ th. *Turbo striatus*, *Adams*, in Lin. Trans. iii. 66. tab. 13. fig. 25. 26. *Mont. Test. Brit.* 312. *Cingula striata*, *Flem. Br. Anim.* 307. *R. communis*, *Forbes. Faun. Mon.* 17.

Hab. On Fuci between tide marks, frequent.

Snail with white filiform tentacula, the eyes sessile at their base; foot linear-oblong, with plain margins. There are often one or two pale yellowish spiral bands on the body of the shell; and the whorls are frequently ribbed across, the ribs on the body disappearing before they reach the middle, and sometimes only to be traced in a nodulous line along the suture. Worn specimens from shell-sand are smooth and white, with the yellowish bands more distinctly visible.

2. *R. interrupta*, shell conical, pellucid, smooth, with five flattish whorls marked with oblong brown spots crossing the upper half, and a spiral band at the base of the body; aperture suborbicular. Length $\frac{1}{2}$ th. *Turbo interruptus*, *Mont. Test. Brit.* 329. tab. 20. fig. 8. *Cingula interrupta*, *Flem. Br. Anim.* 308.

Hab. Very common between tide marks.

There is a variety of this shell without any spots, but with a white band in the middle of the body-whorl and winding up the spire, though less distinct there. The snail is an active creature, and can swim on the surface of the water in a reversed position like the aquatic pulmoniferous mollusca. The tentacula are long, filiform, white, the eyes at their base and sessile; head bilobate; foot white, linear-oblong, plain, free anteriorly, and capable of considerable elongation, the anterior portion divided from the posterior by a band distinguished by a difference in its colour, and on each side of it there is a sort of fin or fold of an oblong shape.

3. *R. semistriata*, shell conical, pellucid, white, with two rows of brown spots on the rounded whorls, which are spirally striate;

whorls six; aperture suborbicular. Length $\frac{1}{10}$ th. Turbo semi-striatus, *Mont. Test. Brit. Sup.* 136. Cingula pulchra, *Johnston* in *Eclin. New Phil. Journ.* June 1828, p. 80.

Hab. Berwick Bay, very rare.

This differs from the preceding in being broader in proportion to its length, in having two rows of oblong spots on the body and second whorls, in being marked spirally with faint impressed spiral striæ, and in the whorls being divided by a deeper suture. I have referred the species to the Turbo semi-striatus of Montagn on the authority of my valued friend Mr Alder.

4. *R. parva*, shell conical, light-brown, with six rounded whorls ribbed across, the ribs smooth, obtuse, and rather numerous; aperture roundish, with thin and slightly reflected lips. Length two lines. Turbo parvus, *Mont. Test. Brit.* 310. Cingula parva, *Flem. Brit. Anim.* 306.

Hab. Berwick Bay, rare.

The ribs are strong, equidistant, and scarcely interrupted at the suture, but they terminate abruptly on the body-whorl in a faint spiral ridge. The lower half of the body is smooth, and marked with a brown band.

5. *R. alba*, shell conical, whitish, banded with brown, smooth, glossy, ribbed across the whorls, of which there are six, the apical ones plain; aperture roundish-oval with a slightly everted lip. Length $\frac{1}{10}$ th. *Forbes*, *Faun. Mon.* 16. Cingula alba, *Flem. Br. Anim.* 309.

Hab. Berwick Bay, rare.

Mr Forbes remarks that this is probably a variety of *R. parva*.

6. *R. subulata*, shell subulate, very smooth, white, with two brown bands on the body winding up the spire at the suture; whorls nine or ten, flat, scarcely defined; aperture ovate, pointed above, white with a pellucid rim. Length $\frac{3}{10}$ ths. Turbo subulatus, *Dillw. Rec. Sh.* 881. Phasianella subulata, *Flem. Br. Anim.* 301. Melania Donovanii, *Forbes*, *Faun. Mon.* 15.

Hab. Berwick Bay, rare.

Besides the two bands about the middle of the body, the base is tinted with the same colour. The inner lip is reflected on the pillar, and continued round to the outer, as in other Rissoæ.

7. *R. reticulata*, shell conical, strong, opaque, yellowish blotched with brown, cancellated with spiral and transverse striæ; whorls six, rounded, defined by a deep suture, the apical ones smooth; aperture round with a slight perforation behind the pillar, the lips plain, thickish. Length $\frac{1}{10}$ th, breadth one half the length. Turbo reticulatus, *Mont. Test. Br.* 322. pl. 21. fig. 1. Cingula reticulata, *Flem. Br. Anim.* 306.

Hab. In shell sand, rare.

8. *R. costata*, shell conical, white with a brown tinge, thick, with six rounded whorls strongly striate in a spiral direction and ribbed across, the ribs strong, many, somewhat waved; aperture roundish, with a thick reflected crenulate rim, and a groove behind the pillar. Length $\frac{1}{3}$ th. Turbo costatus, *Mont.* Test. Brit. 311. tab. 10. fig. 6. Cingula costata, *Flem.* Br. Anim. 305.

Hab. Berwick Bay, rare.

14. ODOSTOMIA. FLEMING.

"Shell conical; aperture ovate; peristome incomplete retrally, and furnished with a tooth on the pillar."—*Fleming*.

1. *O. spiralis*, "whorls five, the lower part of the largest striated spirally; the remainder of the shell ribbed transversely." *Flem.* Brit. Anim. 310.

Hab. In shell sand from Eyemouth.

Shell conical, white, pellucid, the whorls five, flat, divided by a deep and rather broad suture, transversely ribbed; the body-whorl angulated towards the base and marked with spiral ridges, the upper half crossed with numerous plain flattish ribs. Length one line; breadth half its length.

15. SKENEA. FLEMING.

Shell discoid, smooth, the whorls rounded; aperture circular, the margin united all round; operculum circular, horny. Littoral.

1. *S. depressa*, shell depressed, corneous, flat above, widely umbilicate beneath; whorls four, wrinkled across: aperture circular, the margins free. Diam. one line. *Flem.* Brit. Anim. 313. Helix depressa, *Mont.* Test. Brit. 439. tab. 13. fig. 15.

Hab. On flat rocks between tide marks in Berwick Bay, in great profusion. The shell is blackish when alive: operculum horny. Tentacula two, filiform, white, rather short, the eyes at their external base, sessile; mouth probosciform; foot short, tapered posteriorly, with plain margins. The animal swims with great facility in a reversed position; and in structure appears to be almost identical with Rissoa.

16. VALVATA. MÜLLER.

Shell spiral, horny, the spire discoidal or only slightly elevated, with rounded volutions; aperture circular, with a continuous sharp-edged rim; operculum horny, spiral, its volutions numerous and close-set. Fluvatile.

1. *V. piscinalis*, shell globular with an elevated obtuse spire, corneous; the whorls four, rounded, finely wrinkled across; aperture circular, the margins free; umbilicus deep. Diam. nearly $\frac{1}{2}$ ths. *Flem.* Brit. Anim. 286. Turbo thermalis, *Dillw.* Rec. Sh. 852.

Hab. Slow streams and ponds. In the Tweed and Whiteadder near Berwick, plentiful.

This shell is plentiful in the marl dug out of peat bogs. When living it is of a pale-greenish horn colour, transparent and marked with a few dark lines, which shew the course of the intestine. The animal is white and vivacious, gliding along the bottom with its tentacula widely spread, the posterior one projecting from under the upper angle of the aperture, or swimming with ease in a reversed position on the surface. Mouth proboscoidiform darker: tentacula three, setaceous, lateral: eyes sessile, superior, at the base of the anterior tentacula: near the posterior tentaculum there is occasionally extruded an elegant plumose appendage supposed to be subservient to respiration: foot transparent white, oblong, wider and rounded behind, in front produced on each side into an acutely triangular process. Operculum horny, with circular striae.

2. *V. cristata*, shell depressed, corneous, with four whorls flat above, the base widely and deeply umbilicate exposing the rounded whorls; aperture circular. Diam. 2 lines. *Flem. Brit. Anim.* 286. *Turbo cristatus*, *Dillw. Rec. Sh.* 883.

Hab. Ponds. In the Whiteadder near Berwick.

The animal is strictly aquatic, and never leaves the water even when confined to a small vessel. It can creep along the surface with the shell reversed. Behind the two anterior tentacula is a third, as in the preceding species, but the plumose appendage I have not seen, though the animal has been kept for several days together to allow repeated examinations. Eyes at the base of the anterior tentacula, rather prominent, with a light areola. Foot bilobed in front, the lobes becoming triangular when fully extended, posteriorly rounded.

The *PALUDINA ACHATINA* I have occasionally found on the shores of our bay, having been brought in ballast from the Thames.

17. TORNATELLA. LAMARCK.

Shell oval or oblong, with a short rather obtuse spire; aperture longitudinal, elongated, contracted above and widened below; outer lip simple, acute; pillar with one or more plaits.

1. *T. fasciata*, shell ovate, pale-purplish red, the body marked with two distant white bands and spirally striated; spire small, conical, of six whorls; aperture white, the pillar with an oblique fold. Length $\frac{4}{10}$ ths; breadth $\frac{2}{10}$ ths. *Lam. Anim. s. Vert. vi. ii.* 220. *T. tornatilis*, *Flem. Br. Anim.* 336. *Voluta tornatilis*, *Dillw. Rec. Sh.* 503.

Hab. Berwick Bay, very rare.

The striae are much stronger and wider apart at the base of the shell.

18. STYLIFER. BRODERIP.

Shell thin and transparent, spiral with a produced apex; aperture somewhat ovate, narrowed above, with an acute sinuated lip: no operculum.—*Zoophagous*.

1. *S. globosus*, shell globose, yellowish horn-colour, transparent, quite smooth; whorls five; the two lower ones very tumid, the three terminal ones abruptly minute, produced. Length 1 line. *Phasianella styliifera*, *Turton* in Zool. Journ. ii. 367, tab. 13, fig. 11.

Hab. Berwick Bay, attached to the spines of *Echinus esculentus*, very rare.

19. VELUTINA. FLEMING.

Shell subglobose, covered with a distinct epidermis, the body-whorl very large and the spire small, lateral; aperture large, no pillar, the margins acute, entire: no operculum.—*Zoophagous*?

1. *V. lævigata*, shell ampullaceous, horn-coloured, roughish, spirally striate, thin and subpellucid; body-whorl very large, ventricose, the aperture roundish; spire depressed, of three minute whorls. Length $\frac{5}{10}$ ths; diam. nearly $\frac{2}{5}$ ths. *V. vulgaris*, *Fleming* in Edinburgh Encyclop. xiv. 625. *V. lævigata*, *Flem.* Brit. Anim. 326. *Gould's* Report, p. 241, fig. 159. *Helix lævigata*, *Dillw.* Rec. Sh. 971.

Hab. Deep water, not uncommon.

The shell is covered with a rough epidermis, and the striæ constitute properly fine ridges which are crossed by others less distinct; but when the epidermis is removed by tossing on the shore, the surface becomes smooth or faintly striolate, and the shell itself is then either pure white, or pale rose-colour.

The animal is white and entirely fills the shell: tentacula two, tapered, short; eyes on an enlarged space at the external base of the tentacula; foot oblong, short, with plain margins: cloak plain, entire; above the outer tentaculum the male organ appears in the shape of a short thick obtuse process.

20. CORIOCELLA. BLAINVILLE.

Animal naked, gasteropodous; cloak shield-like, sinuated in front, overlapping and concealing the body; head quadrangular and depressed with the tentacula produced from the outer and anterior angles; tentacula two, conical; the eyes sessile at their external bases; penis extrusile from the left side behind the tentaculum; foot triangulate, truncate in front, the margins plain. *Shell* earshaped, white, patulous.

1. *C. tentaculata*, "tentacula produced, filiform; the foot pointed behind." *Lamellaria tentaculata*, *Montagu* in Lin. Trans. xi, 186, pl. 12, figs. 5, 6. *Sigaratus tentaculatus*, *Flem.* Brit. Anim. 360.

Hab. In deep water among corallines, and under stones at low-water mark. It is not uncommon on the shores of Holy Island, and in autumn of 1840 was found in abundance in the Coves-Haven.

The *slug*, when extended, is about three quarters of an inch long, of a circular or oval form, the back convex, roughish or granulous, of a wood-brown colour, speckled with a few irregular reddish and yellow dots, duskier in the centre, the margin of the cloak widely overlapping the foot, deeply sinuated in front, and with an obscure emargination behind. The head is truncate with two white awl-shaped tentacula, which are contractile and originate in the anterior angles, having the eyes, which are black and very distinct, at their external bases. The mouth is terminal, furnished within the fleshy lip with small cartilaginous jaws, and a long, narrow, linear, or riband-shaped tongue, roughened with spinules arranged in regular series. Above the head, and under the cloak, there is a large slit which leads to the branchial cavity and the water of respiration is conducted to this wide orifice by a short canal formed by a fold of the cloak; and it is this fold which produces the frontal sinuation, for there is really no interruption in the margin of the cloak. Within the cavity there lies retroflected the male organ of generation, which seems very large in proportion to the animal: it is somewhat compressed, obtuse, with a long point directed backwards. Foot oblong, truncate in front, where it is opaque milk-white, the rest of it being watery white. The space between it and the cloak is more or less tinted with black or violet.

The *shell* is concealed and embedded in the cloak, occupying a dorsal and central position. It is three lines broad and about five long, ear-shaped, convex, milk-white, even and apparently smooth; but, when looked at through the magnifier, it is seen to be wrinkled by the lines of growth; spire depressed, small, consisting of a single whorl; aperture very patulous, oblong, the inferior margin somewhat truncate, the pillar lip flattened, and continued in a spiral form within the shell.

The creature creeps very slowly, and, when in progression, raises itself on the foot, while, at the same time, the tentacula are extended to the utmost, and protrude beyond the margin of the cloak: when at rest, they are kept concealed under this their penthouse. It swims easily in a reversed position at the surface, the foot being then made slightly concave. The form of the foot is variable; for sometimes the animal will expand it until it becomes almost circular, or extend it until it forms an oblong square obtusely pointed behind. When alarmed, the body is contracted so that the edges of the cloak meet together on the ventral aspect, and the foot is greatly narrowed. The eyes are proportionably large, and are visible from below, shining through the transparent skin.



Neotoma helioides.

Galathea

necca

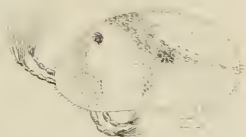


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MEMORANDUM REGARDING THE REPRINTING OF
VOL. I. OF THE "HISTORY OF THE BERWICKSHIRE
NATURALISTS' CLUB."

IN CONCLUDING the re-production of the first volume of the Club's Proceedings, I have to state that it is an exact reprint of the original, press errors excepted. Two of the original wood-cuts and one of the plates were supplied by Mrs Barwell Carter; two plates and one cut have been re-engraved. The reprint is from my own and the Club's copies of the Proceedings, and the press was corrected from Dr Johnston's own copy.

For many years there had been a wish entertained by those whose sets of the Proceedings were deficient, to have a copy of the volume; and at the Jubilee Meeting, the Club sanctioned a reprint, provided that it was undertaken under my supervision. The first attempt failed; and a second, where a single member liberally proposed to guarantee the greater share of the expense was never brought to a conclusion; when Mr George Muirhead took a more business view of the situation, and by means of subscriptions has at last raised the requisite funds.

The reprint is from a new fount of type, and the printer has endeavoured to make it uniform with the other volumes. The impression is limited to 200 copies. I hope it will prove satisfactory to all concerned. A List of Subscribers is appended.

JAMES HARDY.

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